United States Court of Appeals

for the Second Circuit

JOINT APPENDIX

76-7336

United States Court of Appeals

For the Second Circuit

Docket No. 76-7336

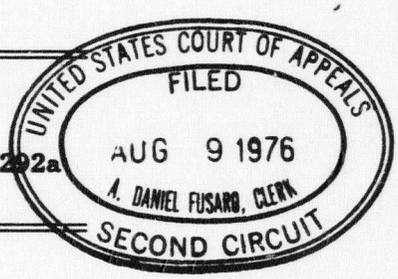
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P/S

JACOBSON & COMPANY, INC.,
Plaintiff-Appellee,

against

ARMSTRONG CORK COMPANY,
Defendant-Appellant.

On Appeal from the United States District Court for the Southern District of New York



JOINT APPENDIX

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DIST/OFFICE	DOCKET YR.	DOCKET NUMBER	FILING DATE MO.	DAY	YEAR	J	N/S	O	R	R 23	DEMAND $ OTHER	JUDGE NUMBER	JURY DEM.	DOCKET YR.	DOCKET NUMBER
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PLAINTIFFS	DEFENDANTS
JACOBSON & CO.,INC.	ARMSTRONG CORK CO.

WEINFELD,J.

1 a

CAUSE

violatio of Sherman Clayton Antitrust Act sls

ATTORNEYS

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581-9000

Donovan Leisure Newton & Irvine
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489-4100

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76 Civ. 2376 JACOBSON & CO., INC. VS ARMSTRONG CORK CO. WEINFIELD, J.

DATE	NR.	PROCEEDINGS
5-26-76	1	Filed complaint and issued summons.
05-26-76	2	Filed affdvt. and order appointing person to serve process. - Clerk.
06-04-76	3	Filed pltfs affdvts and OSC for a preliminary injunction. Ordered that deft. produce deposition of Phillip Unger, Richard Wiley and J.E. Snyder, etc. - OSC ret. on 6-15-76 -- Weinfeld, J.
06-11-76	4	Filed pltfs notice to take depositions of Paul Langan on 6-30-76 and request to produce. -- subp. issued.
06-11-76	5	Filed pltfs notice to take depositions of Berger Acoustics, Inc. by William Marshal on 6-28-76 and request to produce.
07-02-76	6	Filed OPINION #44702...The motion for a preliminary injuncti compelling Armstrong to continue to sell products is granted Submit order on consent. Weinfeld, J. m/n
06-17-76	7	Filed ANSWER of deft. DLN&I
07-08-76	8	Filed defts affdvt. of Philip W. Unger in opposition to pltf motion for prel. injunction.
07-08-76	9	Filed defts affdvts of J.E. Snyder, Richard C. Wiley and James W. Goodwillie in opposition to motion for a prel. injunction.
07-08-76	10	Filed pltfs reply affdvt. in support of motion for prel. injunction.
07-08-76	11	Filed pltfs reply memorandum in support of # 3.
07-08-76	12	Filed pltfs memorandum of law in support of # 3.
07-08-76	13	Filed pltfs suppl. memorandum summarizing evidence obtained as a result of expidited discovery of deft.
07-08-76	14	Filed defts memorandum of law in opposition to # 3.
07-08-76	15	Filed depositions of Richard C. Wiley dtd. 6-9-76.
07-08-76	16	Filed deposition of Jacob E. Snyder dtd. 6-8-76.
07-08-76	17	Filed deposition of Philip Unger dtd. 6-7-76.
07-13-76	18	Filed order that pltfs motion for a prel. injunction is granted and upon filing of a bond in the sum of $10,000 deft. is enjoined as indicated. Weinfeld, J.
07-13-76	19	Filed pltfs Undertaking in the sum of $10,000. on prel. injunction - bond #001 SB 035934 BCA - The Aetna Casualty & Surety Co.
07-13-76	20	Filed defts affdvt. re order for prel. injunction.
07-13-76	21	Filed defts notice of appeal to the USCA for the 2nd Circuit from order of prel. injunction filed 7-13-76. - copies maile
07-19-76	22	Filed notice that the original record has been certified and transmitted to the USCA this date.

3a FILED
US DISTRICT COURT
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Complaint, Filed May 26, 1976

UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF NEW YORK

JACOBSON & COMPANY, INC.,

Plaintiff,

-against-

ARMSTRONG CORK COMPANY,

Defendant.

76 Civil No. 2376

JURY TRIAL DEMANDED

JUDGE WEINFELD

COMPLAINT FOR INJUNCTIVE RELIEF AND FOR DAMAGES (VIOLATION OF THE ANTITRUST LAWS)

Plaintiff, by its attorneys, Moses & Singer, for its complaint against defendant, alleges:

JURISDICTION AND VENUE

1. This is a complaint for treble damages and injunctive relief under the antitrust laws of the United States, 15 U.S.C. ¶¶ 1 et seq. This Court has jurisdiction of this action under 15 U.S.C. §§ 15, 22 and 26, and the action is brought as a result of defendant's violations of §§ 1 and 2 of the Sherman Act (15 U.S.C. §§ 1 and 2), § 3 of the Clayton Act (15 U.S.C. § 14) and § 2(e) of the Clayton Act [known as the Robinson-Patman Act] (15 U.S.C. § 13).

2. Plaintiff Jacobson & Company, Inc. ("Jacobson") is a New York corporation with a principal place of business at 104 East 25th Street, New York, New York. Jacobson is a

contractor in the business of furnishing and installing acoustical ceiling systems, interior partitions and other interior building products.

3. Jacobson is a distinguished firm, founded in 1889, and has been a leader in the design and installation of acoustical ceiling systems. Jacobson enjoys an excellent reputation with owners, general contractors, architects and builders. It sells and installs acoustical ceiling tiles and other building materials in the Metropolitan New York area, Fairfield County, Connecticut, New Jersey, Eastern Pennsylvania, and Delaware. Jacobson also has done work on construction projects in other areas of the country.

4. Jacobson maintains an executive office in New York City, a sales office and warehouse in Elizabeth, New Jersey, and a sales office in Lansdowne, Pennsylvania. In the last few years, its revenues from completed jobs have generally exceeded twelve million dollars a year, and its net worth was $1,385,000 as of December 31, 1975. Jacobson recently has concentrated its efforts on large projects, involving complex ceiling systems, which may incorporate, not only acoustical ceiling tile, but heating, ventilating, air-conditioning equipment and light fixtures in a single unitary system. Jacobson has also diversified its activities by opening a "Supply Center" in Elizabeth, New Jersey, which sells acoustical ceiling tiles and other building materials, directly to schools, hospitals and others, who do their own installation. As a result of this new program, Jacobson's customers are able to obtain acoustical ceiling products at reduced prices, and to avoid expensive installation costs.

5. Defendant Armstrong Cork Company ("Armstrong") is a Pennsylvania corporation with a principal place of business in Lancaster, Pennsylvania. Armstrong is found, and transacts substantial business, in the Southern District of New York.

6. Armstrong is the leading manufacturer of acoustical and non-acoustical ceiling products in the United States. In 1975 its total sales were $859,412,000 of which 19% resulted from sales of ceiling products. Armstrong offers the most complete range of ceiling products available in the industry, and its advertising, promotional and sales program far surpass those of its competitors. It is believed that Armstrong sells at least 40% of all the ceiling products sold in this country.

DEFENDANT'S ILLEGAL ACTS

7. Beginning at least as early as March of 1968, and continuing to the present, Armstrong and others have engaged in an unlawful combination and conspiracy to restrain and monopolize interstate trade and commerce, and Armstrong has unlawfully attempted to monopolize and restrain interstate trade and commerce, in violation of Sections 1 and 2 of the Sherman Act, and Armstrong has engaged in other acts in violation of Sections 2(e) and 3 of the Clayton Act. This unlawful combination, conspiracy and attempt to monopolize and restrain trade has consisted of continuing agreements and concerts of action whereby:

(a) Armstrong has required that all of its products which an owner, builder, architect or other user may wish to purchase in particular markets have to be purchased, in most cases on an installed basis only, through distributors who Armstrong designates;

(b) Armstrong has restrained, coerced and prevented its distributors from reselling or installing products purchased from Armstrong outside of geographic territories proscribed by Armstrong;

(c) Armstrong has participated in a combination and conspiracy with certain of its distributors in Eastern Pennsylvania whereby the participants have divided markets and allocated territories, and agreed not to compete in the resale of Armstrong products in territories allocated to the other participants;

(d) Armstrong has granted to one distributor an exclusive distributorship for Armstrong products in a territory consisting of Metropolitan Philadelphia and portions of Southern New Jersey and, in furtherance thereof, has prevented other distributors from reselling or installing Armstrong products in such exclusive territory;

(e) Armstrong has sold its products to distributors on condition that such distributors not bid or otherwise deal in products of competitors of Armstrong, on construction projects where Armstrong products could be used, where the effect of such condition has been to substantially lessen competition and to create a monopoly in the market for ceiling products; and

(f) Armstrong has discriminated in favor of its distributor in the Philadelphia, Pennsylvania market by furnishing services and facilities to such distributor in connection with the sale of Armstrong products, where such services and facilities were not accorded to other purchasers of Armstrong products on proportionately equal terms.

These acts were committed with the purpose and effect of preventing, reducing and limiting competition in the market for ceiling products, and constituted an attempt to monopolize and a combination with others to monopolize the market for such products.

8. In March 1968, Armstrong designated Jacobson as an authorized distributor of Armstrong products in the New York City Metropolitan area, and certain adjoining counties, on the condition that Jacobson would not use or deal in the products of Armstrong's competitors on construction projects where Armstrong materials could be used. Jacobson's distributorship was also conditioned on its agreement not to install or resell products

it purchased from Armstrong in the Philadelphia, Pennsylvania market area, where Armstrong had, and still has, an exclusive distributorship arrangement with Berger Acoustics, Inc. ("Berger"), a local firm.

9. When Jacobson was unwilling to acquiesce in Armstrong's territorial restrictions on the resale of its products and decided to bid Armstrong products on construction jobs in the Philadelphia region, Armstrong coerced, intimidated and threatened Jacobson with loss of its distributorship. Armstrong also refused to give Jacobson pricing information and other services required by Jacobson to bid on construction work in the Philadelphia area.

10. Jacobson insisted that it be given the information and support which was made available on a regular basis to Berger, and demanded that the services and facilities of Armstrong's Philadelphia sales office also be made available to Jacobson. Armstrong eventually agreed to give Jacobson pricing for jobs in the Philadelphia area but continued its refusal to give Jacobson access to its Philadelphia sales office, and required Jacobson to obtain information on construction work in the Philadelphia area through its New York regional sales office. As Armstrong well knew, its New York sales office could not provide the services and assistance which Berger received, and Jacobson needed, to compete effectively for work in the Philadelphia area. As a result of this discrimination in services and facilities, Jacobson was not able to obtain significant construction jobs in the Philadelphia region requiring Armstrong products.

11. Beginning in January 1975, Jacobson developed and began active promotion of a Supply Center in Elizabeth, New Jersey, which offered Armstrong products and materials, on a non-installed basis, to schools, hospitals, contractors and other users. Starting in the fall of 1975 Jacobson actively promoted and advertised in the Philadelphia region the products offered by the Supply Center, and assigned a sales representative solely to develop the Philadelphia market for the Supply Center.

12. In February 1976,Jacobson sought to bid on a major construction job in Atlanta, Georgia. Armstrong took the position that Jacobson would not be given assistance unless it agreed not to bid any other company's products in connection with the job. Armstrong also indicated that it did not want Jacobson bidding on jobs in Atlanta, Georgia, where Armstrong has other distributors. Only after Jacobson insisted that Armstrong's position was unlawful, did Armstrong provide Jacobson with pricing information for the Atlanta job.

13. On March 19, 1976, without any prior notice, Armstrong informed Jacobson that its distributorship was terminated. Armstrong gave no satisfactory or plausible explanation for refusing to deal with Jacobson, a reputable customer who had purchased and paid for millions of dollars in Armstrong products over an eight year period.

14. Upon information and belief, Armstrong terminated Jacobson's distributorship solely because Jacobson objected and refused to adhere to the aforesaid unlawful practices on resale of Armstrong products, which defendant sought to impose.

IRREPARABLE INJURY

15. Armstrong's ceiling systems and materials are far superior to those of its competitors and many of its products are proprietary and cannot be duplicated by other suppliers. All, or substantially all, of Jacobson's major competitors are authorized Armstrong distributors. To maintain the patronage of its customers and to remain competitive as a leading ceiling contractor, Jacobson must have access to Armstrong products and be able to offer them for resale and installation. Without such access, Jacobson would be precluded from bidding on a substantial portion of available construction work, and the operations of its Supply Center, whose sales largely involve Armstrong products, would be severely damaged.

16. If Jacobson's distributorship of Armstrong products is terminated, it will suffer great injury to its good will, reputation, and relationship with past and potential customers, and the public will be harmed because competition in the Philadelphia market area and elsewhere will be suppressed or eliminated.

17. As a direct result of the above described unlawful acts by Armstrong, Jacobson has already suffered, and will continue to suffer, substantial damages.

18. Jacobson has no adequate remedy at law.

WHEREFORE, plaintiff prays:

1. That a preliminary and permanent injunction issue restraining defendant from refusing to sell to plaintiff as an Armstrong distributor upon customary and non-discriminatory terms and conditions of sale, and from imposing or attempting to impose any unlawful restraints or requirements upon plaintiff.

2. That plaintiff recover from defendants treble damages, plus costs and counsel fees.

3. That plaintiff have such further and other relief as is just and proper.

Dated: New York, N. Y.
May 25, 1976

MOSES & SINGER

By David Glenhaw

A Member of the Firm
Attorneys for Plaintiff
Office & P. O. Address:
51 West 51st Street
New York, New York 10019
(212) 581-9000

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

JACOBSON & COMPANY, INC.,	:	76 Civ. No. 2376 (EW)
Plaintiff,	:	
- against -	:	ANSWER
ARMSTRONG CORK COMPANY,	:	
Defendant.	:	

Defendant ARMSTRONG CORK COMPANY, by its attorneys, answer the complaint brought against it as follows:

1. Defendant admits that plaintiff purports to bring this action for treble damages and injunctive relief under the antitrust laws of the United States, 15 U.S.C. ¶¶ 1 et. seq. and that this Court has jurisdiction over the subject matter of this action. Except as expressly admitted herein, defendant denies each and every allegation of the first paragraph of the complaint.

2. Defendant denies knowledge and information sufficient to form a belief as to the truth of the allegations of the second paragraph of the complaint, except admits that plaintiff is a contractor in the business of furnishing and installing acoustical ceiling systems.

3. Defendant denies each and every allegation of the third paragraph of the complaint, except denies knowledge and information sufficient to form a belief as to the truth of the allegations of when plaintiff was founded and what it sells besides ceiling products and admits that plaintiff sells and

installs acoustical ceiling tiles in the Metropolitan New York area, Fairfield County, New Jersey, Eastern Pennsylvania and Delaware and in certain other areas of the country and admits on information and belief that until the last few years, plaintiff did a significant amount of business in the installation of acoustical ceilings.

4. Defendant denies knowledge and information sufficient to form a belief as to the truth of the allegations of the fourth paragraph of the complaint, except admits that plaintiff maintains a sales office and warehouse in Elizabeth, New Jersey and that plaintiff within the last few years has concentrated its efforts on large projects and has opened a "Supply Center" in Elizabeth, New Jersey in order to sell acoustical ceiling products directly to customers on a non-installed basis, and denies that installation costs are avoided by purchasing ceiling products from supply centers such as plaintiff's.

5. Defendant admits that it is a Pennsylvania corporation with its principal place of business in Lancaster, Pennsylvania and admits that it sells products to contractors and wholesalers located in the Southern District of New York. Except as expressly admitted herein, defendant denies each and every allegation of the fifth paragraph of the complaint.

6. Defendant denies each and every allegation of the sixth paragraph of the complaint, except admits that its consolidated 1975 sales were $859,412,000, of which approximately 19% resulted from sales of ceiling products.

7. Defendant denies each and every allegation of the seventh paragraph of the complaint.

8. Defendant denies each and every allegation of the eighth paragraph of the complaint.

9. Defendant denies each and every allegation of the ninth paragraph of the complaint.

10. Defendant denies each and every allegation of the tenth paragraph of the complaint, except admits that plaintiff did request services for jobs in the Philadelphia area and alleges that defendant provided plaintiff with such services.

11. Defendant denies knowledge and information sufficient to form a belief as to the truth of the allegations of the eleventh paragraph of the complaint, except admits that sometime in the last year or two plaintiff opened a "Supply Center" in Elizabeth, New Jersey in order to sell acoustical ceiling products, including defendant's products, to customers on a non-installed basis.

12. Defendant denies each and every allegation of the twelfth paragraph of the complaint, except admits that defendant provided plaintiff with pricing information to bid Armstrong products on a Federal Office Building project in Atlanta, Georgia and alleges that plaintiff bid non-Armstrong products on that project.

13. Defendant denies each and every allegation of the thirteenth paragraph of the complaint, except admits that defendant, on March 19, 1976, terminated plaintiff as a contractor-distributor of defendant.

14. Defendant denies each and every allegation of the fourteenth paragraph of the complaint.

15. Defendant denies each and every allegation of the fifteenth paragraph of the complaint and alleges that while defendant would prefer to believe that its ceiling line is the best, there are various lines of competitive ceiling products comparable in breadth and quality to defendant's, all of which are available to, and utilized by, plaintiff, and there are presently many contractor-distributors and supply centers within the New York region that do not carry defendant's line, but nevertheless have in the past competed successfully with plaintiff and other contractor-distributors of defendant.

16. Defendant denies each and every allegation of the sixteenth paragraph of the complaint.

17. Defendant denies each and every allegation of the seventeenth paragraph of the complaint.

18. Defendant denies each and every allegation of the eighteenth paragraph of the complaint.

AS AND FOR A FIRST AFFIRMATIVE DEFENSE

19. The complaint fails to state a claim against defendant upon which relief can be granted.

AS AND FOR A SECOND AFFIRMATIVE DEFENSE

20. The purported causes of action set forth in the complaint are barred in whole or in part by the applicable Statute of Limitations, 15 U.S.C. § 15(b).

AS AND FOR A THIRD AFFIRMATIVE DEFENSE

21. Plaintiff is barred by laches, waiver, estoppel and unclean hands from maintaining this action against defendant.

Dated: New York, New York
June 16, 1976

DONOVAN LEISURE NEWTON & IRVINE

By _____
A Member of the Firm

30 Rockefeller Plaza
New York, New York 10020

Attorneys for Defendant
Armstrong Cork Company

Order to Show Cause for Preliminary Injunction,
Filed June 4, 1976

16.a

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

- x

JACOBSON & COMPANY, INC.,

Plaintiff,

- against -

ARMSTRONG CORK COMPANY,

Defendant.

ORDER TO SHOW CAUSE FOR PRELIMINARY INJUNCTION

76 Civ. No. 2376

- x

Upon filing and reading the annexed complaint, and the accompanying affidavits and exhibits thereto, and it appearing to the Court that irreparable damage may result to plaintiff if defendant terminates plaintiff's distributorship a[nd] refuses to deal with plaintiff[s] it is hereby, unless of the application hereof is served upon defendant counsel when affidavits

ORDERED, that defendant show cause before the United States District Court for the Southern District of New York, in Room 1305 of the United States Courthouse, Foley Square, New York, New York, on the 15th day of June, 1976, at ~~ten o'clock~~ 2:15 pm in the ~~forenoon,~~ afternoon, or as soon thereafter as counsel may be heard, why a preliminary injunction (Pursuant to Rule 65 FRCP) should not be issued restraining defendant, its agents, servants, employees, and all persons in active concert or participation therewith, pending the final hearing and determination of this action, from:

(a) terminating plaintiff as an authorized distributor of defendant's products;

BEST COPY AVAILABLE

(b) refusing to sell its products to plaintiff upon customary and non-discriminatory terms and conditions;

(c) granting such other and further relief as the Court may find just and proper; and it is further

ORDERED, pursuant to F.R.C.P. 30(a) that defendant shall produce for deposition Phillip Unger, Richard Wiley, and J. E. Snyder, employees of defendant, pursuant to the Notice of Deposition annexed to the affidavit of David N. Ellenhorn, Esq, counsel for plaintiff, pursuant to Saddle Brook Telegraphers by the atty. and it is further

ORDERED, that (send) service of a true copy of this order to show cause and the papers on which it is granted, by personally delivering them to defendant's office in Saddle Brook, New Jersey, on or before 5 P.M., on May 27, 1976, shall be sufficient service; and it is further

ORDERED, that defendant's answering affidavits and memorandum, if any, shall be served upon plaintiff by personally delivering copies thereof to plaintiff's counsel, Moses & Singer, at 51 West 51st Street, New York, New York, on or before 5 P.M., on June 11, 1976, and it is further Ordered that the order to show cause without prejudice to the defendants defenses during the period prior to the return date of the motion, the plaintiff by its officers or agents

Dated: New York, New York
May 27, 1976

9:10 A.M.

/s/ Edward Weinfeld
U.S.D.J.

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

JACOBSON & COMPANY, INC.,

Plaintiff,

-against-

ARMSTRONG CORK COMPANY,

Defendant.

CIV. NO.

AFFIDAVIT IN SUPPORT OF PLAINTIFF'S MOTION FOR PRELIMINARY INJUNCTION

STATE OF NEW YORK)
) SS.:
COUNTY OF NEW YORK)

DAVID N. ELLENHORN, being duly sworn, deposes and says:

1. I am a member of the Bar of this Court and of Moses & Singer, attorneys for plaintiff Jacobson & Company, Inc. ("Jacobson").

2. I submit this affidavit in support of plaintiff's motion for a preliminary injunction restraining the defendant Armstrong Cork Company ("Armstrong"), its agents, servants, employees, and others in active concert or participation with any of them, pendente lite, from refusing to sell Armstrong products to the plaintiff, from terminating plaintiff's distributorship, and granting such other and further relief as to this Court may seem just and proper.

3. Attached hereto are the complaint, and affidavits in support of plaintiff's motion. These affidavits, by John D. Jacobson, president of plaintiff, and Jerome M. Lasky, Esq., counsel to plaintiff present clear and convincing evidence that defendant has followed a policy of restricting plaintiff's resale

of Armstrong products in violation of the antitrust laws, and that defendant is attempting to continue violating the antitrust laws by terminating plaintiff's Armstrong distributorship because of plaintiff's resistance to defendant's unlawful restrictions on the resale of its products. The affidavits also establish that plaintiff will be irreparably harmed if defendant is not restrained from terminating the distributorship, and that defendant will suffer no harm if such an injunction is issued.

4. Plaintiff is proceeding by order to show cause since it is imperative that plaintiff's motion for a preliminary injunction be heard at the earliest possible time in order to prevent irreparable damage to plaintiff. Plaintiff asks the Court to schedule a prompt hearing on the motion and also asks for leave to take depositions in aid of the hearing, of three of defendant's employees, Phillip Unger, Richard Wiley and J. E. Snyder, all of whom were directly involved in the decision to terminate plaintiff's distributorship. A copy of a Notice of Deposition to be served upon defendant is annexed hereto.

5. No prior application has been made to any court or judge for the relief sought herein.

Sworn to before me this
26th day of May, 1976.

Notary Public

DAVID N. ELLENHORN

3. Pulkrabek stated that the termination had nothing to do with Jacobson's credit standing or business ethics. He offered to furnish Jacobson with a letter to that effect. I informed him that that was not our purpose in requesting the meeting and that we were only interested in having Jacobson reinstated as an Armstrong distributor. He then said that Armstrong had terminated Jacobson for the following reasons:

(a) Pulkrabek first stated that Armstrong was dissatisfied with the volume of sales of Armstrong products by Jacobson, and, in particular, with the fact that there had been a recent drop in orders on Jacobson's books for future jobs requiring Armstrong products. I had been informed that Jacobson had several jobs on its books requiring substantial quantities of Armstrong products, and that shortly before receiving the termination notice Jacobson had obtained a very important job requiring large quantities of Armstrong materials, of which Armstrong was fully aware. When I mentioned this to Pulkrabek he said he was not familiar with the matter.

(b) Pulkrabek next stated that Jacobson had been terminated because it had concentrated its work on large jobs and had not been seeking smaller jobs. I told Pulkrabek that in my view this reason was not valid because I knew of other Armstrong distributors who, like Jacobson, had concentrated on the larger jobs and had not been terminated. I stated that I would give credence to his alleged reason when Armstrong terminated Harry Rich, Inc., another distributor whom my client had informed me sought only large jobs. To my surprise,

Pulkrabek replied that Armstrong had been dissatisfied with Harry Rich, Inc., for this very reason, and had called in the principal of that company to inform him that he would have to change this policy or the Armstrong distributorship would be cancelled. I asked Pulkrabek why my client had not been given a similar warning, and an opportunity to conform to Armstrong's wishes, instead of being terminated summarily, but Pulkrabek had no answer. I then assured Pulkrabek that my client was most anxious to keep the Armstrong distributorship and was fully prepared actively to solicit small jobs if that was what Armstrong really wanted. Pulkrabek stated, in effect, that in the case of Jacobson it was too late to correct this situation.

(c) Pulkrabek stated that a further reason for termination was the fact that Jacobson had closed its Long Island office and planned to close its New York City office. I pointed out that the Long Island office had been closed more than two years ago on prior notice to Armstrong, without any objection or complaint from Armstrong either before or after the closing. I also pointed out that Jacobson had continued to service Long Island and did substantial business there without a Long Island office. I also said that the planned closing of the New York City office had not yet taken place, and that if and when, it did, there would be no problem in Jacobson servicing New York City from its Elizabeth, New Jersey office.

4. During the meeting I advised Pulkrabek that Armstrong had many other distributors servicing the New York City - Long Island area, and that if Armstrong sincerely

believed that Jacobson could no longer adequately service that area, and the other distributors were not enough for this purpose, all Armstrong had to do was to appoint still another distributor, but that this would be no reason for terminating Jacobson. How, I asked, would terminating Jacobson give Armstrong better distribution in New York City and Long Island? To this question, there was no answer.

5. I told Pulkrabek that we were convinced that Jacobson's termination had nothing to do with the stated reasons and that we were quite certain that Jacobson had been terminated because of the activities of its Supply Center (and particularly its intense mail-order solicitation of the Philadelphia area); the continuation by Jacobson of its activities in the Philadelphia area, where Berger Acoustics Inc. is the exclusive Armstrong distributor; and Jacobson's knowledge of and insistence of its rights under the antitrust laws.

6. Pulkrabek replied that the termination was not related to the operation of Jacobson's Supply Center or its activities in the Philadelphia area. He said the termination was "purely a business matter" based on the fact that the "market approach" of Jacobson and Armstrong were "going in divergent directions." He denied that the reaons stated by me were factors in Jacobson's termination.

7. Pulkrabek said further that Armstrong had bent over backwards in the past to cooperate whenever Jacobson had a request or complaint. He stated that if Jacobson pursued any antitrust claims as a result of its termination, Armstrong might not continue to cooperate as it had done in the past, in connection with open jobs on which Armstrong had

previously agreed to furnish materials and products to Jacobson. Pulkrabek then vociferously denied that this was a threat, or that he was attempting to induce Jacobson to accept without protest termination of the distributorship.

8. The meeting concluded with Pulkrabek saying that he would take up with management Jacobson's request that Armstrong reconsider its decision to terminate the distributorship. However, few days later I was notified by a letter from Miller that Armstrong had decided to adhere to its decision.

Jerome M. Lasky

Sworn to before me this
25TH day of May, 1976

Irving D. Alter
Notary Public

IRVING D. ALTER
NOTARY PUBLIC, State of New York
No. 24-4613045
Qualified in Kings County
Commission Expires March 30, 1977

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

JACOBSON & COMPANY, INC., Plaintiff, -against- ARMSTRONG CORK COMPANY, Defendant.	:	AFFIDAVIT IN SUPPORT OF PLAINTIFF'S MOTION FOR PRELIMINARY INJUNCTION

STATE OF NEW YORK)
: SS.:
COUNTY OF NEW YORK)

JOHN D. JACOBSON, being duly sworn, deposes and says:

1. I am the President of plaintiff Jacobson & Company, Inc. ("Jacobson"). I submit this affidavit in support of plaintiff's application for a preliminary injunction restraining the defendant, Armstrong Cork Company ("Armstrong"), from terminating plaintiff's Armstrong distributorship, or refusing to sell its products to plaintiff, and for such other and further relief as to this Court may seem just and proper. The complaint herein charges defendant with seeking to terminate plaintiff's distributorship in violation of the antitrust laws and, in addition to the preliminary injunction, demands a permanent injunction and treble damages.

The Parties

2. Plaintiff Jacobson is a New York corporation, founded in 1889, with a principal place of business at

104 East 25th Street, New York, New York. Jacobson has a long and distinguished history in the construction field. That history is summarized briefly in a leaflet published by the company, a copy of which is annexed hereto as Exhibit A.

3. At present, Jacobson is a contractor in the business of furnishing and installing acoustical ceiling tile and systems, partitions, and other interior assemblies. Jacobson enjoys an excellent reputation with owners, general contractors, architects and builders. It sells and installs acoustical ceiling tile and other building materials in the Metropolitan New York City area, the entire States of New Jersey and Delaware and in Eastern Pennsylvania. Jacobson also has done work on construction projects in other areas of the country.

4. Jacobson maintains an executive office in New York City, a sales office and warehouse in Elizabeth, New Jersey, and a sales office in Lansdowne, Pennsylvania. In the last few years, its revenues from completed jobs have generally exceeded twelve million dollars a year, and as of December 31, 1975 its net worth was $1,385,000. A copy of a recent favorable Dunn & Bradstreet report on Jacobson is annexed hereto as Exhibit B.

5. In view of the widespread recession which has plagued the construction industry in the last few years, Jacobson has concentrated its recent efforts on large projects, involving complex ceiling systems, which may incorporate not only acoustical ceiling tile, but heating,

ventilating, air-conditioning equipment and light fixtures in a single unitary system. Jacobson also has diversified its activities by opening a "Supply Center" in Elizabeth, New Jersey, which sells acoustical ceiling tile, and other building materials, directly to schools, hospitals and others, who do their own installation. The success of this new program has enabled Jacobson's customers to obtain acoustical ceiling produts at reduced prices, while avoiding expensive installation costs.

6. Defendant Armstrong is a Pennsylvania corporation, which manufactures and sells various products in the interior furnishings field, including acoustical and non-acoustical ceilings and ceiling systems designed for installation in commercial, institutional and residential buildings. In 1975, Armstrong's total sales were $859,412,000. of which about 19% came from sales of ceiling systems and materials.

7. Armstrong has the largest and most attractive range of ceiling systems and patterns in the industry. Many of its acoustical ceiling systems are proprietary, and there are no competitive substitutes for them. Annexed hereto as Exhibit C are catalogues published by Armstrong and three of its competitors. A comparison of these catalogues will readily demonstrate the superiority and greater variety of Armstrong's product line.

8. Armstrong's sales force appears to be the best trained and most able in the industry, and the

Company's advertising and promotional programs are more extensive and effective than those of its competitors. Annexed hereto as Exhibit D are two sales brochures recently put out by Armstrong, which will give the Court an indication of its highly successful promotional efforts.

9. As the result of its superior products and promotional activities, Armstrong clearly is the dominant supplier in the field of ceiling systems, and, I understand, sells about 40% of all the acoustical ceiling products marketed in the United States today.

The Establishment of Jacobson's Distributorship

10. By 1968, it was evident that Armstrong had become the leading supplier in the acoustical ceiling field. It was necessary, therefore, for Jacobson to have access to Armstrong products if Jacobson were to continue to obtain valuable contracts for the installation of ceiling systems. Armstrong agreed to appoint Jacobson as an authorized distributor and installer of Armstrong products, in a letter dated March 28, 1968. A copy of the letter is annexed hereto as Exhibit E.

11. Under the terms of the March 28, 1968 letter, Armstrong appointed Jacobson as an authorized distributor, but only on certain conditions. Specifically, the letter stated that Armstrong "would expect to be your (Jacobson's) sole major supplier" in the Long Island area, with a similar provision dealing with Westchester and Fairfield Counties and New York City. The letter also provided that Jacobson

was not to sell or install Armstrong products in the Philadelphia area, despite the fact that Jacobson then had an office and warehouse in Philadelphia, and had been active in that area since 1937.

12. In most areas of the country Armstrong has more than one authorized distributor, and in the areas serviced by Jacobson, Armstrong has about twenty distributors. In the Philadelphia area, however, Armstrong has maintained an exclusive arrangement for twenty-five years with Berger Acoustics, Inc. ("Berger"), a local firm. Thus, as a practical matter, any owner, builder or contractor in the Philadelphia area who wishes Armstrong products for a construction project has had to deal with Berger. (I believe that Armstrong also has exclusive distributorships with Standard Acoustics of Lancaster, Pennsylvania and Duggan-Marcon of Allentown, Pennsylvania.)

13. Armstrong has sales representatives who work in regional sales offices located throughout the country. These sales representatives service Armstrong's distributors by furnishing them with the special pricing, design specifications, technical information and other services which the distributor must have to bid successfully on jobs requiring Armstrong products. The Armstrong sales representatives also refer architects, contractors and other potential customers to the local Armstrong distributors in their area. In Philadelphia, the Armstrong sales office devotes a substantial portion of its efforts to servicing projects which Berger is promoting, bidding or engaged in, and

presumably refers all work in the area to Berger. For these reasons, Armstrong insisted from the start that Jacobson stay out of the Philadelphia area, which was reserved for Berger.

14. In view of its dominant position in the industry, Jacobson has become increasingly dependent upon Armstrong products. To begin with, many of Armstrong's ceiling systems are proprietary and there are no competitive substitutes available. In addition, the specifications on many construction jobs often require the use of Armstrong's ceiling systems and products. Without access to Armstrong, Jacobson simply would be unable to compete successfully with its competitors, almost all of whom are Armstrong distributors, and Jacobson would therefore lose a substantial portion of the limited work which is presently available in the construction industry.

Armstrong's Continuing Efforts To Prevent Jacobson From Bidding Armstrong Products In The Philadelphia Area.

15. By 1970 Jacobson was no longer willing to acquiesce in Armstrong's territorial restrictions on the resale of Armstrong products, and decided to bid Armstrong products on major construction jobs in the Philadelphia area.

16. In order to do this, Jacobson had to obtain pricing and other information and services from Armstrong's Philadelphia sales office. Accordingly, in March 1970, I met with James O. Sampson, Architectural Sales Manager of Armstrong, and J. E. Snyder, District Manager of Armstrong's Philadelphia sales office, and told them that Jacobson was

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eager to bid on construction jobs in the Philadelphia area. Sampson and Snyder said they would consider establishing a relationship between Jacobson and Armstrong's Philadelphia sales office; but when Jacobson attempted to pursue the matter, Snyder wrote a letter, dated January 14, 1971, rejecting Jacobson's request for access to Armstrong's Philadelphia sales office. A copy of the letter is attached hereto as Exhibit F.

17. After receiving this letter, I wrote Sampson and reiterated Jacobson's intention to bid Armstrong products on construction jobs in the Philadelphia area. A copy of my letter is annexed hereto as Exhibit G. Sampson wrote back and emphatically stated that Armstrong did not want Jacobson selling Armstrong products in the Philadelphia area, although he conceded that Jacobson had the "legal right" to sell Armstrong products in that area. His letter warrants quotation since it plainly reveals Armstrong's restrictive territorial policies. In pertinent part, the letter states:

> "Jake [Snyder] recognizes your problems with a centralized warehouse at Elizabeth and your right to order Armstrong material for shipment into his territory when this is to your advantage. Legally, we can't prevent this, but frankly, we would prefer that you do not promote or sell our materials in that market.
>
> Looking strictly at our Philadelphia territory, we still do not feel it would be fair to Berger to service your Philadelphia office from our Philadelphia office. We have operated with Berger as our sole distributor in the Philadelphia market for over 20 years. During that period, Berger has consistently increased their sales of our products, and their performance last year was exceptionally good.

With this long relationship, our Philadelphia office has full access to all of the contacts, information, and objectives of the Berger group. Jake doesn't feel that his men could now work closely with your Philadelphia Representatives without violating confidences that should be respected.

...We recognize that it will not be fully satisfactory or effective to obtain information, samples, etc., through our New York office, but this is the only arrangement we're in position to offer..." (emphasis added)

A copy of this letter is annexed hereto as Exhibit H.

18. Despite Sampson's letter, Jacobson continued to press for access to the Philadelphia market area. On October 22, 1971, Ivan C. Park, Jr., a Vice-President of Jacobson, wrote Armstrong's New York Sales Manager and asked him to intercede with Armstrong's Philadelphia regional office in the hope of establishing a working relationship between Jacobson and the Philadelphia office. A copy of Park's letter is annexed hereto as Exhibit I.

19. Park's letter brought no response, so I wrote directly to J. H. Binns, President of Armstrong, and requested that he personally review the situtation. In pertinant part, my letter to Binns stated:

"For the purpose of simplifying our inventory, we have been selling and installing Armstrong materials in the Southern New Jersey and Eastern Pennsylvania market without the services or assistance from your Philadelphia Regional Office. As a major customer of Armstrong Cork Company, our sales personnel should receive maximum assistance from your sales offices...

We recently bid a job in Pennsylvania (Penns Grove) and we asked for price and

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> technical information from your regional office and from Lancaster direct and we were denied the information. We were unable to bid the job on the basis of Armstrong. This puts us in a very serious competitive situation in this market.
>
> Mr. Binns I am appealing to you for your assistance and personal review in this matter to see if there is some way that Jacobson & Company can receive equal treatment along with other Armstrong distributors in the Southern New Jersey and Eastern Pennsylvania area. Your assistance will be greatly appreciated." (Emphasis added).

A copy of this letter dated January 17, 1972, is annexed hereto as Exhibit J.

20. Philip W. Unger, General Sales Manager of Armstrong, replied to my letter to Binns, by writing me that Armstrong had no intention of expanding its distributorship system in the greater Philadelphia area, and would not allow its Philadelphia regional sales office to deal with Jacobson. A copy of Unger's letter dated February 4, 1972, is annexed hereto as Exhibit K.

21. I wrote back to Unger on February 22, 1972, and emphasized that Armstrong's refusal to furnish Jacobson with prices for special materials used on major construction jobs, and to give Jacobson access to Armstrong's Philadelphia office, was precluding Jacobson from bidding on jobs in the Philadelphia area. In my letter I stated:

> "..[T]he refusal of your sales representatives to furnish us with prices for special materials and other necessary technical assistance will, in many cases, including the Penns Grove job mentioned in my letter of January 17th to Mr. Binns and another job in which we are interested in Allentown for the Pennsylvania Power and Light Company, effectively serve to preclude us from bidding Armstrong

products. The refusal to furnish us with this assistance on Philadelphia area projects is tantamount to a restriction against reselling Armstrong material we purchased from you for installation on these projects."

A copy of my letter is annexed hereto as Exhibit L.

22. Unger replied in a letter, dated March 9, 1972, in which he stated, obviously for the record, that Armstrong was not attempting to prevent Jacobson from bidding on Armstrong products outside its territory. He did not however, offer to provide Jacobson with access to Armstrong's Philadelphia sales office, without which Jacobson could not compete with Berger. A copy of Unger's letter is annexed hereto as Exhibit M.

23. This lengthy exchange of correspondence between Armstrong and Jacobson was followed by a personal meeting between representatives of the company, at which we were told that Jacobson could thereafter get pricing for jobs in Philadelphia but only through Armstrong's New York regional sales office. Armstrong's refusal to give Jacobson access to the Philadelphia office continued unchanged.

24. As Armstrong well knew, its New York sales office had no real interest in Philadelphia projects and could not provide the services and assistance which Berger received, and Jacobson needed, to compete effectively for work in the Philadelphia area. The result was that during the early seventies Jacobson obtained virtually no construction jobs in the Philadelphia region requiring Armstrong products.

Jacobson's Efforts To Diversify and Broaden Its Operations In Conflict With Armstrong's Anti-Competitive Policies

25. In January 1975, Jacobson opened its Supply Center. Althugh there are a few distributors who sell Armstrong products and materials directly to contractors and other users, without installation, to the best of my knowledge very few other distributors, if any, have promoted these "material only" sales as actively as Jacobson has done. With owners and builders looking today for ways to reduce construction costs, we saw an opportunity to promote the sale of acoustical ceiling materials directly to hospitals, schools and other institutions who are able to install the ceiling materials by using their own maintenance personnel. We also saw a market for Armstrong products among small contractors who have not had access to Armstrong materials and who have been foreclosed up to now from bidding on small jobs where Armstrong products are required or specified.

26. Last fall, Jacobson had a supply of surplus acoustical materials, most of them Armstrong products, which it wished to sell. Jacobson first offered the Armstrong materials to Armstrong, who declined to repurchase them. Then, on October 10, 1975, Jacobson sent a flyer to the trade offering these materials through our Supply Center, at prices substantially below those Armstrong or its other distributors would normally charge for them. Armstrong's sales representatives later reported to Jacobson that other Armstrong distributors complained about these sales efforts by Jacobson.

27. Last fall, Jacobson also expanded the promotional activities of its Supply Center. Between August 1975, and March 1976, over 6,000 advertisements were mailed to hospitals, schools, acoustical contractors and other potential customers in Pennsylvania, Southern New Jersey and Delaware. (Copies of a few of these advertisements are annexed hereto as Exhibit N). In addition, Jacobson assigned a sales representative solely to develop the Philadephia market for the Supply Center. Thus, through the Jacobson Supply Center, building and maintenance personnel in the Philadelphia area have been able to secure Armstrong products, from another source than Berger.

28. Jacobson has also broadened its area of operations recently by bidding on jobs in other areas of the country. For example, in February 1976, we decided to bid on a major construction job in Atlanta, Georgia, involving the installation of ceilings in the Richard B. Russell Federal Building. Before bidding for this job, we asked Armstrong to supply us with design requirements, technical data and pricing information to determine whether we would bid Armstrong products for the job. Armstrong took the position that Jacobson would not be given such information unless it agreed not to bid any other company's products in connection with the job, and an Armstrong sales representative indicated that Armstrong did not want Jacobson bidding on jobs in the Atlanta area at all, since Armstrong "had good distributors in Atlanta". It was only after I personally objected that Armstrong's refusal to assist Jacobson was anti-competitive, that Armstrong provided the information Jacobson needed to consider whether to bid Armstrong products for the Atlanta job.

Armstrong's Decision To Terminate Jacobson As A Distributor

30. On March 19, 1976, Philip Unger and Richard Wiley of Armstrong told me, at a meeting in Jacobson's Elizabeth, New Jersey office, that Armstrong had decided to terminate Jacobson's distributorship. The only reasons for termination given by Unger were (1) that Jacobson was not working on as many small jobs as it had done in prior years, and (2) that its purchases of Armstrong materials had allegedly diminished. A formal termination letter, dated March 19, 1976, arrived a few days later, stating that Jacobson was terminated as an Armstrong distributor, "effective as of the date of your receipt of this letter." A copy of the termination letter is annexed hereto as Exhibit O.

31. The decision to terminate Jacobson came with no advance warning or notice. Indeed, on March 10-12, 1976, just a few days earlier, I attended a convention of Armstrong distributors and sales representatives in Lancaster, Pennsylvania, Armstrong's headquarters, and no mention was made of any problems which might give rise to such drastic action. Thus, Armstrong abruptly terminated Jacobson, a financially sound and responsible distributor who had purchased and paid for millions of dollars of Armstrong products over an eight-year period.

32. Armstrong's explanation for terminating Jacobson's distributorship is not plausible. Unger told me that Armstrong objected to the fact that Jacobson has

concentrated its work on large jobs, and no longer undertakes small construction projects. Although Jacobson continues to do some small and medium size work, like many other major Armstrong distributors, it has recently emphasized work on large construction projects. Armstrong was told of this change of emphasis a long time before its abrupt termination of the distributorship, and voiced no objection. Moreover, if this shift in emphasis were really of conern to Armstrong, it obviously would have advised Jacobson that the distributorship might be terminated unless it was prepared to do more small work on a regular basis. Armstrong would not simply have abruptly terminated the distributorship.

33. Unger also said that Armstrong was terminating the distributorship because Jacobson's purchase of Armstrong products had fallen off. During the last five years, Jacobson's purchases of Armstrong products have been at the following levels:

1971 -	$ 905,178
1972 -	792,091
1973 -	1,139,164
1974 -	860,764
1975 -	605,000

(I should add that Jacobson's puchases from Armstrong's competitors during this period were minuscule by comparison.) In addition to these purchases, prior to March 19, 1976,

Jacobson notified Armstrong of contract orders actually on Jacobson's books which will require purchases of Armstrong products during the near future costing Jacobson more than $500,000. Thus, contrary to Unger's assertion, Jacobson's purchases of Armstrong products have remained substantial despite the unprecedented decline in construction work, and Jacobson continues to obtain major jobs requiring Armstrong products. Moreover, I believe that Jacobson's purchases from Armstrong during the last several years have exceeded those of many, if not most, of Armstrong's other distributors in this area.

35. The reasons given by Armstrong for terminating Jacobson's distributorship simply do not make sense. It is obvious that Armstrong actually terminated the distributorship because Jacobson refused to abide by Armstrong's restrictions and insisted on its right to resell Armstrong products wherever, and to whomever, it chose. Armstrong would not tolerate this effort to interfere with its distribution system and therefore terminated the distributorship. I am advised by counsel that Armstrong's termination of Jacobson's distributorship for these reasons is a per se violation of the antitrust laws.

Irreparable Injury To Jacobson If Injunctive Relief Is Not Granted

36. As mentioned above, Armstrong has approximately 40% of the market for acoustical and non-acoustical ceiling systems and materials in the United States. Its products

are superior to those of its competitors, and many of its ceiling systems are proprietary and cannot be duplicated by other suppliers. All, or substantially all, of Jacobson's major competitors are authorized Armstrong distributors. The specifications on many construction projects often designate Armstrong ceiling systems. Other projects require the installation of either Armstrong products, or products which are at least equal to those manufactured by Armstrong. Thus, without access to Armstrong products Jacobson will be foreclosed from obtaining contracts for a great many projects and will be unable to compete for construction jobs with Armstrong's other distributors. A recent example will demonstrate this point. Prior to Jacobson's termination as a distributor on March 19, 1976, Jacobson secured a major job involving the installation of Armstrong's ceiling systems at the Texaco Building in White Plains, New York. This job alone will entail payments to Jacobson of over $800,000. Without access to Armstrong products, at the competitive prices Armstrong offers its distributors, Jacobson simply would not have been able to get this important job. Indeed, a preliminary review of our records indicates that without Armstrong products Jacobson would have lost perhaps one-third to one-half of all of the work it secured during the last three and a half years.

38. Loss of Armstrong's products would also have a devasting effect on Jacobson's Supply Center. During its first year of operation, the Supply Center had sales of about $350,000. Armstrong products represented more than

50% of the sales of ceiling materials made from the Supply Center during that period. In the first four months of 1976, the Supply Center had sales of about $123,000, approximately 78% of which were of Armstrong products. Although it was opened only recently the Supply Center is rapidly becoming a major source of revenue and profit for Jacobson. Without access to Armstrong products the Supply Center would be virtually wrecked. In addition to the irreparable harm which termination of the distributorship would cause Jacobson, termination would also damage the public by eliminating competition between distributors of Armstrong products.

39. A preliminary injuction requiring the continuation of Jacobson's distributorship would cause no harm to Armstrong. Defendant would simply continue to have its products distributed by a reputable firm, whose sales of Armstrong products over a period of eight years have been very substantial and presumably profitable to Armstrong. On the other hand, for the reasons mentioned above, termination of plaintiff's distributorship will cause plaintiff substantial and irreparable damage and loss of good-will and resources at a critical time when plaintiff is already suffering from the depressed conditions in the industry. I respectfully submit that plaintiff shall not have to undergo such irreparable injury, which will threaten its very survival while this action is going forward.

WHEREFORE, plaintiff respectfully requests that

the relief requested herein be granted.

Sworn to before me this
13th day of May, 1976.

JOHN D. JACOBSON

Notary Public
DAVID ELLENBOGEN
Notary Public, State of New York
[illegible]
Qualified in [illegible] County
Commission Expires [illegible], 1977

Exhibit A Annexed to Affidavit of John D. Jacobson
Jacobson & Company, Inc.—a Very Brief History

JACOBSON & COMPANY, INC.

a very brief history

The company that employs you has a history of some interest to everyone as the future of any organization is strongly conditioned by its past and what we are most interested in is the future. Some knowledge of the company's history is useful to sales personnel because, properly used, it can create customers' confidence in the company's ability to survive and perform. The company's record should also be of interest to persons who have either recently joined the company or are considering doing so.

The original company was formed in 1889 in New York City. It was a picture framing business started by the mother of Gustave Jacobson. At an early date, the latter first turned the business into a plain plastering operation and subsequently into an ornamental plastering business. In the first three decades of the new century, the company became the outstanding ornamental plastering concern in the country. Cast plaster period ornament was manufactured on East 44th Street by more than 80 craftsmen.

In the New York area, the company not only worked with architects in the design and manufacture of the plaster ornament, but also installed the material. In many instances the outright specifications for Jacobson ornament on a job carried a "specification allowance" for so many dollars for that part of the work. In other words, the general contractor was obliged to give that part of the work to our company and at a prearranged dollar amount worked out in advance with the architect and our company. We are doing much the same thing today on many jobs, where we get a proprietary specification on the basis of a guaranteed budget for the work.

Some of the jobs performed by the company included the Pompeian Room in the Metropolitan Museum of Art (now the cafeteria); the Cloisters in upper Manhattan; the Presidential Palace in Havana, Cuba; myriads of banks, hotels, retail stores, Fifth Avenue and Park Avenue apartments; large homes and castles on the North Shore of Long Island, in Westchester County, and the like. The company worked closely with such giants in the architectural profession as McKim, Mead and White; John Russell Pope; James Gamble Rodgers; French & Co. and many others.

The company also published a thick catalog filled with details of available period ornament for walls and ceilings, including complete ceilings, columns, pilasters, beams, cornices, brackets, capitals, mouldings, etc. Thus an architect could design and specify around the Jacobson stock ornament available, so that the plastering contractor anywhere in the United States (or in the world) could order the required cast ornament. It would be made in New York and shipped to him for installation by him on his job. Jacobson-made ornament was shipped to South America and Japan where the company was represented by Grace & Company and the Mitsui Company respectively.

Following the severe depression of 1929, the building business came to a virtual standstill in 1930, and for all practical purposes, the ornamental plastering business died. Actually, if the depression had not killed it, style changes would have. The first look at modern architecture occurred at the World's Fair in Chicago in 1930. The new architecture of Germany and the Scandanavian countries eliminated all period ornament and featured sharp, simple lines. While a fair amount of ornamentation has crept back into buildings in the last 40 years, the plaster ornament business was never revived.

In 1932, the Celotex Corporation was looking for a new, exclusive distributor in the New York area and particularly a company with knowledge of plastering; it had just bought an acoustical plaster company and did not quite know what to do with it. Fortunately, for Jacobson, the Celotex regional manager lived at the Beaux Arts Apartments on East 44th Street and passed the office daily on his way to his office at 101 Park Avenue. He found in Victor Jacobson (a son of Gustave Jacobson), who was then running the company, an eager and inventive person who was receptive to getting into the acoustical contracting business.

The acoustical department was organized in October of 1932 and consisted of three men, two from the former Celotex distributor, and Martin Brennan, who was then Eastern staff acoustical engineer for Celotex.

While the company's acoustical business was gradually improving, by 1936 the company found it needed new capital, if it was to get into high gear. At that time, therefore, the company ceased to be a family one and ownership was changed so that it consisted of Victor Jacobson, Herbert Rothschild and Donald Fried, with no one major stockholder exercising control. In 1947 Donald Fried's interest was bought by Martin Brennan, who along with Victor Jacobson and Herbert Rothschild, became one of the three major stockholders in the company.

Business started to boom in 1939 with activities in connection with numerous buildings at the 1939 World's Fair in Flushing Meadows, where the company worked on the theme buildings, the Perisphere and Trylon, as well as the DuPont and General Motors buildings, the Russian and Polish pavillions and numerous others. Then when war broke out in the fall of 1939 in Europe, our country became the arsenal of democracy and business was even better.

The company became interestered in the design and construction of airplane engine test stacks for quieting the roar of the huge engines when they were being run on their test stands. Work was done for Wright Aeronautical first in Paterson, N. J. and then in Dayton, Ohio and Pratt and Whitney in East Hartford, Connecticut. When our country entered the war in 1941, a large Army shop was set up on 61st Street and a Navy shop on 57th Street in New York where hundreds of men worked on all types of test stands which were installed all over this country and around the world. The superintendent, James Peggie, travelled from Kodiak, Alaska to Alameda and San Diego, California; then on to numerous bases in Texas, Louisiana, Florida; up the east coast to jobs in the Carolinas, Maryland, Pennsylvania, New York and New England.

For the outstanding, inventive work of the company, in 1942 it became one of the first companies in the area to be awarded the Army - Navy E (for excellence) Award. The main ballroom of the Waldorf-Astoria Hotel was hired for a party for the entire personnel, all of the suppliers and local authorities to celebrate this award.

Meanwile, permanent operations were started in Philadelphia (1937), Elizabeth (1941), and later in Plainview (1960), where offices and warehouses were established.

In the early 40's, with noise problems becoming increasingly serious in the war plants, the idea of reducing factory or industrial noise to increase efficiency and ward off occupational deafness and other threats to health was receiving great attention. An Industrial Noise Department was established and made numerous noise studies of plant conditions with a sound level meter and frequency analyzer. The company also invented a material called Pydee (ΠD), which you will recognize is the formula for the circumference of a circle. This unit was essentially a cylinder of perforated metal with a sound absorbing blanket inside, made in various lengths and diameters, which served as a unit absorber. This unit was the forerunner of the eight miles of continuous tubular units that were designed and installed in early 1970 in the national headquarters office buildings of the American Can Company in Greenwich, Connecticut. This latter unit not only was a sound absorber, but also served as the duct and diffuser for the air distribution system and carried the fluorescent lighting fixtures which furnished the total illumination of the office spaces.

Seeking a new and effective method to install incombustible tiles on ceilings which would also be readily removable for access to the equipment and services in the space above, the company, in 1950, developed the Acousti-Line system. This proprietary system was completely unique and for several years helped to secure many outstanding jobs on a non-competitive basis before it was successfully imitated. It was also the forerunner of the grid system which is used so widely at the present time.

In 1954 the company became the exclusive distributor for the Burgess-Manning Company's (now Airtex) radiant acoustical ceiling. This unique ceiling system combined sound absorption with radiant heating and cooling capability. In addition to the work of the sheetmetal and lathing craftsmen, steamfitters were now required to install and weld the pipe grids which carried the hot or cold water in the system. The engineering, sale and installation of this system was the type of challenge that the company enjoyed because the item was proprietary, the jobs were all sizable and the profit possibilities exciting.

Following the setting up of new plans to merchandise this radiant - acoustical ceiling, the company actively sought other exclusive franchises for materials and systems which required specialized promotion and installation. In the last 15 years it has acquired exclusive franchises from such companies as Airtex Corporation (radiant - acoustical ceilings); Duo-Flex Corporation (air distribution and ceiling suspension systems); Howard Manufacturing Company (Ventwood, a preassembled wood panel system for ceilings and walls); Hunter Douglas Inc. (Luxalon, an aluminum linear panel ceiling system); Lok Products Company (air distribution and ceiling suspension systems and lighting fixtures); Pittsburgh-Corning Corporation (unit absorbers); Sarturo Modules, Inc. (Dekora, three-dimensional panels for ceilings and walls); The Soundlock Corporation (Soundlock ceiling panels). Additionally the company has franchises on a non-exclusive basis for the acoustical products of Acoustics Manufacturing Company, Armstrong Cork Company, Celotex Corporation, Conwed Corporation, Johns-Manville Corporation, Owens-Corning Fiberglas Corporation and others.

In recent years the company has completed many large integrated ceiling installations for the leading blue-chip corporations and banks of the country, as well as prominent hospitals and educational institutions. The following jobs range in size from $500,000. to $2,000,000. each:

Chase Manhattan Bank,
General Motors Corporation,
Olin Corporation,
Pepsico, Inc.,
Sears Roebuck & Co., and
Nassau County Meadowbrook Hospital

in the New York Metropolitan area;

Bell Telephone of Pennsylvania, and
Philadelphia Electric Company

in the Philadelphia area; and

Hoffmann-LaRoche, Inc., and
Keuffel & Esser Co.

in the New Jersey area.

The company celebrated its 50th Birthday rather quietly back in 1939 because the country was still feeling the effects of the depression. But in 1964, at its 75th Birthday, an interesting and effective presentation was prepared by an advertising agency and sent to both the many customers and the principal architects, engineers and builders in all of the areas in which the company operates. In addition to four separate mailings of interesting material telling about Jacobson's service, growth and history, there was a full page ad in the Architectural Forum Magazine.

In 1964 Victor Jacobson, who was serving as chairman of the Board of Directors, and Herbert Rothschild, treasurer, retired, but continued to serve on the Board of Directors. Martin Brennan, president since 1959, was elected to serve as treasurer as well. John Jacobson, vice president, who joined the company in 1954, was made manager of the New York office, having been manager of the Elizabeth office for several years. In 1969 Victor Jacobson resigned as chairman of the Board of Directors; Martin Brennan was elected chairman and chief executive officer and continued as treasurer, and John Jacobson was elected president and chief operating officer. He became the fourth president of the company in its 80 year history. In August 1972 the stock held by Martin Brennan and Herbert Rothschild was purchased by a group of company managers, including John D. Jacobson, Neal R. Jacobson and Samuel J. Schanzer.

In regard to growth, the company prepares about 500 Federal W-2 forms for the year-round employees. Actually the total is about 1,000, but half of these people are not with the company continuously and work on jobs a fair distance from the main locations of activity. In dollar volume the company's growth has been remarkable.

For more than 16 years our company has enjoyed a Dun & Bradstreet credit rating of 3A1. It means that you have a net worth in excess of one million dollars, that you discount your bills and have an impeccable credit experience. Contracting companies with this credit rating are rare.

In 1968 the company set up the Jacobson & Company, Inc. Profit-Sharing Plan approved by the Internal Revenue Service of the Federal Government. Subject to the customary eligibility rules, all salaried employees of the company are members of this Plan. The Trustee for the Plan is the Bankers Trust Company.

We confidently believe that the best years of the company lie ahead. We expect to find more and larger customers that we will service with an expanded staff of increasingly effective people. We believe our company has much to offer discerning customers, such as the following documented assets:

VISION

EXPERIENCE

STABILITY

CAPACITY

FINANCIAL RESPONSIBILITY

SUPERIOR TECHNICAL KNOW-HOW IN THE

SCIENTIFIC, ENGINEERING AND CONSTRUCTION

PHASES OF EVERY PROJECT

July 1, 1975

Exhibit B Annexed to Affidavit of John D. Jacobson

Dun & Bradstreet Report on Jacobson & Company, Inc.

Dun & Bradstreet Inc.

This report has been prepared for:

ANALYTICAL

SEP 09 1975

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UPDATE

D-U-N-S NO. 00-698-5964
JACOBSON & COMPANY INC
(Subsidiary of Trilone York Corporation, New York, NY)

104 E 25TH ST (8TH FL)
AND BRANCH(ES) OR DIVISION(S)
NEW YORK NY 10010
TEL 212 677-4250

CHIEF EXECUTIVE: J D JACOBSON, CHB

ACOUSTICAL & ENVIRONMENTAL CONTROL SYSTEMS CONTRACTORS

SIC NOS.
17 42

SUMMARY

RATING	3A1
	Also Branches
STARTED	1936
PAYMENTS	DISC-PPT
SALES	$12,000,000
WORTH	$1,930,459
EMPLOYS	200(30 HERE)
HISTORY	CLEAR
CONDITION	STRONG
TREND	STEADY

PAYMENTS	HC	OWE	P DUE	TERMS	JUL 11 1975	SOLD
	100000	65000		Reg	Disc	Over 3 yrs to 6-75
	5000			2 10 25	Disc	Over 3 yrs
	1000			1 10 30	Ppt	Over 3 yrs

HIGHLIGHTS	Dec 31 19?2	Dec 31 1974	Dec 31 1974
Working Capital	1,668,072	1,689,959	1,713,322
Tangible Worth	1,854,197	2,150,586	1,930,459
Current Assets	3,064,194	3,575,344	2,991,845
Current Liabilities	1,396,122	1,885,385	1,278,523
Long Term Liab	109,937	101,286	67,014
Due Banks	500,000	?58,344	659,038
Accts Rec	1,422,514	1,576,231	1,952,895

Detailed sales and operating results are not submitted. Operations through fiscal 1973 showed steady growth in net working capital and equity, each succeeding year. However, losses were shown in 1974 from an unprofitable operation. Annual billings are reported in the area of $12,000,000.

The company had an investment in Stamford Partitions Inc., a dry wall contractor which was discontinued in 1974 after taking losses on some jobs. This loss produced a loss to subject's fiscal operation.

The 1974 figures continue to reflect the maintenance of a strong financial condition with current debt, adequately covered by the aggregate of cash and receivables. Management reports receivables still in good collection at this time. The business makes active use of bank financing to supplement its working funds, and appears to be generating ample funds as evidenced by the above reports from vendors and/or sub-contractors. Long-term debt consists of real estate mortgages and notes payable. This statement is contained in full in the ST of Jul 15 1975.

CHANGES As volume decreases so does the labor force, about 200 are employed at present.

CURRENT On Sep 9 1975 Mrs. Beatrice Stanley, Secretary and Treasurer, referred to the statement dated: Dec 31 1974 as latest available.

(CONTINUED)

THIS REPORT FURNISHED PURSUANT TO CONTRACT FOR THE EXCLUSIVE USE OF THE SUBSCRIBER AS ONE FACTOR TO CONSIDER IN CONNECTION WITH CREDIT, INSURANCE, MARKETING OR OTHER BUSINESS DECISIONS. CONTAINS INFORMATION COMPILED FROM SOURCES WHICH DUN & BRADSTREET, INC. DOES NOT CONTROL AND WHOSE INFORMATION, UNLESS OTHERWISE INDICATED IN THE REPORT, HAS NOT BEEN VERIFIED. IN FURNISHING THIS REPORT, DUN & BRADSTREET, INC. IN NO WAY ASSUMES ANY PART OF THE USER'S BUSINESS RISK, DOES NOT GUARANTEE THE ACCURACY, COMPLETENESS, OR TIMELINESS OF THE INFORMATION PROVIDED, AND SHALL NOT BE LIABLE FOR ANY LOSS OR INJURY WHATEVER RESULTING FROM CONTINGENCIES BEYOND ITS CONTROL OR FROM NEGLIGENCE.

This report has been

Dun & Bradstreet Inc.

JUL 15 1975

ANALYTICAL

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FINANCIAL STATEMENT

JACOBSON & COMPANY INC
NEW YORK NY

D-U-N-S NO. 00-698-5964

FINANCIAL STATEMENT

	Dec 31 1974
Cash	90,319
Accounts Receiv	1,952,895
Mats/Wk Progress	948,631
Total Current Assets	2,991,845
Fixed Assets	210,726
Other Assets	73,425
Total	3,275,996
Notes Pay/Banks	659,038
Notes Pay-Oth	15,000
Accounts Payable	398,387
Accruals	206,098
Total Current Liab	1,278,523
Mtges Pay	33,686
Notes Pay/Oth	33,328
CAPITAL STOCK	168,000
RETAINED EARNINGS	1,762,459
Total	3,275,996
Tangibl Net Worth	1,930,459

(CONTINUED)

BEST COPY AVAILABLE

JUL 15 1975

JACOBSON & COMPANY INC
NEW YORK NY

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(ont'd) SOURCE & BASIS OF FIGURES
Figures of Dec 31 1974 were prepared from a balance sheet accompanied by a letter of transmittal signed by Beatrice Stanley, Sec/Treas.

Accountant(s): Greenspan & Yelon, CPA'S, New York. Extent of audit, if any, not indicated for statement of Dec 31 1974.

Fixed assets shown net less $229,548 reserve for depreciation.

IN THE INTEREST OF SPEED, FINANCIAL STATEMENTS ARE ISSUED AS RECEIVED WITHOUT REVIEW. THE FIGURES WILL BE REVIEWED AGAINST THE RATING AT A SUBSEQUENT DATE.
07-17(743 /M45) 31 001

SOURCE & BASIS OF FIGURES
Figures of Dec 31 1973 represent the individual financial condition of subject.

Figures of Dec 31 1973 were prepared from a balance sheet accompanied by a letter of transmittal signed by Beatrice Stanley, Secretary and Treasurer and received by mail.

Accountant(s): Greenspan & Yelon, CPA's. Extent of audit, if any, not indicated.

Contingent Debt: None indicated. Fixed assets shown net less $211,115 reserve for depreciation.

PLEMENTAL DATA
Management reports Fire Insurance: that adequate fire insurance is carried on all fixtures, equipment and materials.

TORY
Started: In 1889 by the late Gustave S. Jacobson, and succeeded by the subject corporation in 1936.

Incorporated: New York Apr 17 1936.

Authorized Capital Stock: 200 shares Class "A" (voting) and 3,800 shares of Class "B" common (non-voting).

Control: 100% of the outstanding capital stock is held by Trilone York Corp.

Outstanding Capital Stock: $168,000 at Dec 31 1973.

Martin J. Brennan retired in 1973. Ivan C. Park, Jr., resigned in 1973. Brennan's stock was sold back to the company. As of Oct 8 1974 Park still maintains some holdings but is not a director.

Past Performance: This company has successfully completed a number of projects over the years. Work has been performed for leading industrial and commercial concerns and others. While management has not furnished a detailed list of work in progress, the value of the contracts completed is substantial.

RATION
Subject is a wholly-owned subsidiary of Trilone York Corporation, a Delaware corporation formed in 1972. It is located at the caption address and acts only as a holding company, holding the stock of this one concern. On Oct 7 1974 Mrs. B. Stanley, Secretary and Treasurer, stated there are no inter-company relations with the subject.

Scope: Acoustical and environmental control systems contractors with subject acting both as a prime contractor and sub-contractor.

Clientele: Work is performed for general contractors, commercial and industrial concerns, private institutions and others.

Territory: Southern New York State, Southern Connecticut, all of New Jersey, Eastern Pennsylvania and Northern Delaware.

(CONTINUED)

JACOBSON & COMPANY INC
NEW YORK NY

A-CD OCT 8 1974
Page 1

FINANCIAL STATEMENT

	Dec 31 1971	Dec 31 1972	Dec 31 1973
Cash	$ 276,383	$ 396,705	$ 136,668
Accts Rec	1,196,014	1,422,514	1,576,231
Inventory & Work In	1,102,112	1,244,975	1,862,445
Total Current Assets	2,574,509	3,064,194	3,575,344
Fixed Assets	256,599	257,678	219,022
Other Assets	75,246	38,384	41,119
Other Assets			301,772
Total	2,906,354	3,360,256	4,137,257
Due Bank	200,000	500,000	758,344
Notes Pay (Others)	8,301	15,000	15,000
Accounts Payable	390,608	458,531	775,720
Accruals & Taxes	541,367	422,591	336,321
Total Current Liab	1,140,276	1,396,122	1,885,385
Notes Pay (Others)	8,301	55,000	54,656
Mtge Pay	64,646	54,937	44,630
Capital Stock	168,000	168,000	168,000
Surplus	1,525,131	1,686,197	1,982,586
Total	2,906,354	3,360,256	4,137,257
Net Working Capital	1,434,233	1,668,072	1,689,959
Current Ratio	2.26	2.21	1.89
Tangible Net Worth	1,693,131	1,854,197	2,150,586

(CONTINUED)

JACOBSON & COMPANY INC
NEW YORK NY

A-CD OCT 8 1974
Page 4

+JOHN D. JACOBSON, CHMN OF BOARD, PRES & CHIEF EXEC
+SAMUEL J. SCHANZER, V PRES
+NEAL R. JACOBSON, V PRES-DIRECTOR OF CONSTRUCTION
MRS. BEATRICE G. STANLEY, SEC & TREAS
WILLIAM T. BRENNAN, ASST TREAS

DIRECTORS: The officers identified by (+) and Victor Jacobson.

MANAGEMENT BACKGROUND

JOHN D. JACOBSON, born 1929, married, Joined this company 1954 as salesman, 1960 elected a Vice President and made manager of Elizabeth, NJ branch. Became manager of New York branch in 1964. Appointed general manager of company in 1969 and elected President and chief operating officer Jan 1 1970.

SCHANZER, born 1939, married, Joined this company 1965 as salesman in the Environmental Control Systems Department. Elected Vice President 1970, appointed company sales manager Jul 1970.

NEAL R. JACOBSON, born 1923, married, Joined this company in 1946 as member of the construction department. Became Superintendent of Construction in New York office in 1959, Was elected a Vice President and appointed Director of Construction for the entire company in 1970.

STANLEY, joined this company in 1936. Elected Assistant Secretary in 1963. Secretary in 1965 and a Director of the company 1966. In charge of accounting and bookkeeping department.

BRENNAN, married, Joined this company in 1957. Manager of Credit and Collection Department. Elected Assistant Treasurer in 1966.

VICTOR JACOBSON, born 1901, married, Employed by the predecessor as Vice President and general manager, Was President of the company 1936 to Jan 1 1970 at which time he was elected Chairman of the Board. Retired as Chairman of the Board Jan 1 1970 and now continues as Director and Shareholder.

JACOBSON & COMPANY INC
NEW YORK NY

A-CD OCT 8 1974
Page 3

ERATN (cont'd)

Terms: Contracts are undertaken on a lump sum basis with monthly progress payments of 85% to 90% on work completed monthy and retained percentages upon completion and approval.

Employees: About 100, including officers, salesmen, office employees, draftsmen, engineers, etc. Field force of mechanics and foremen from a low of 100 to 500 men depending on season, 30 are generally employed at the headquarters.

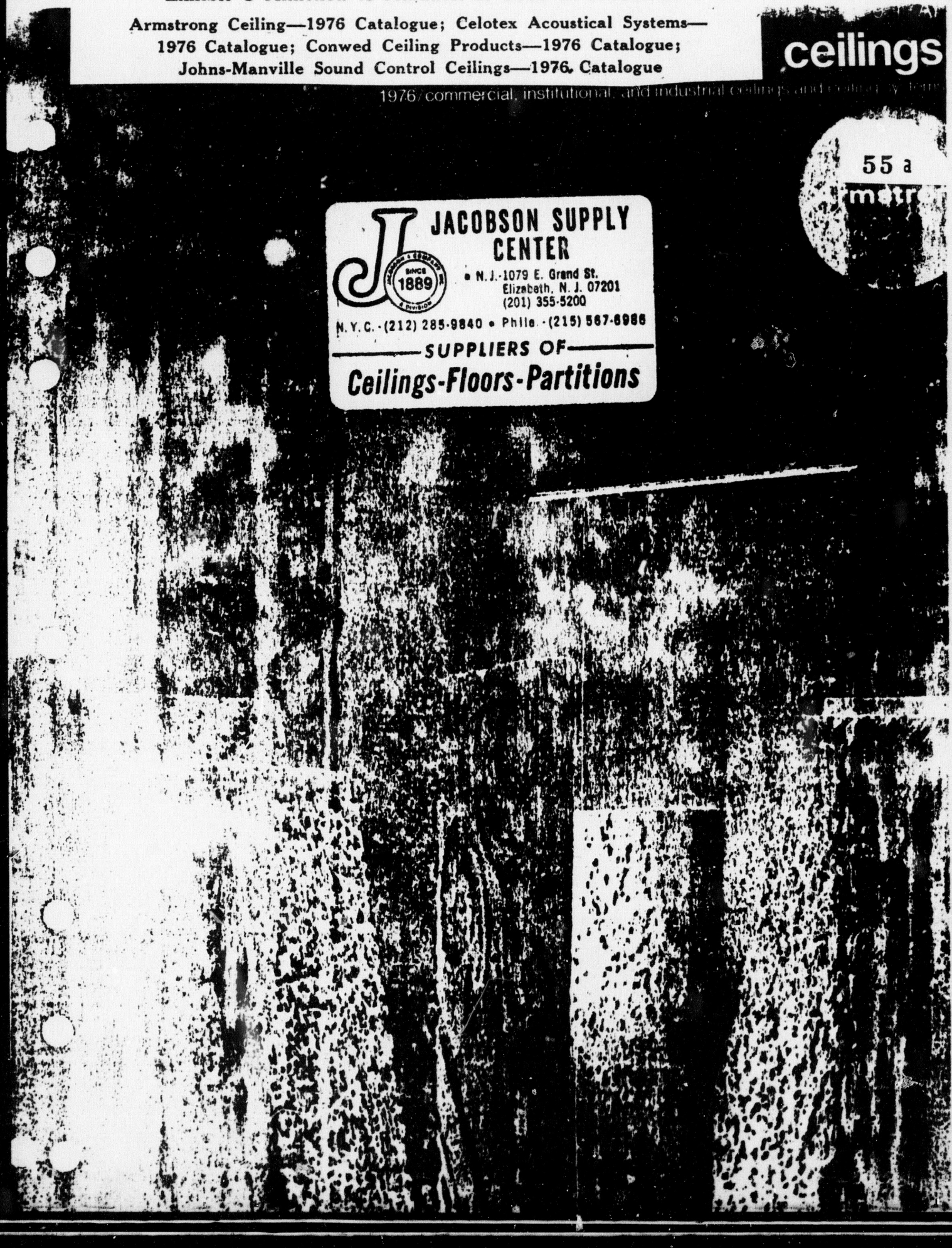
Facilities: Rents offices on the 8th floor of a multi-story building maintained in good condition and located eastside of Manhattan. Premises orderly.

Branch Facilities: Maintained at 105 South Service Road, Plainview, Long Island, NY; 10 Grove Street, Cherry Hill, NJ 08034 and consolidated warehouse facilities and offices at 1074 East Grand Street, Elizabeth, NJ.

(CONTINUED)

Exhibit C Annexed to Affidavit of John D. Jacobson

Armstrong Ceiling—1976 Catalogue; Celotex Acoustical Systems—1976 Catalogue; Conwed Ceiling Products—1976 Catalogue; Johns-Manville Sound Control Ceilings—1976 Catalogue



eiling Trade Name/Property Selector Chart

Armstrong

his chart is a quick reference ol to help you locate the rmstrong acoustical ceiling oduct, by brand name, that eets specific feature quirements of job design.

arious ceiling properties or atures are listed on the chart's ft side. Trade names and age reference numbers are cross the top.

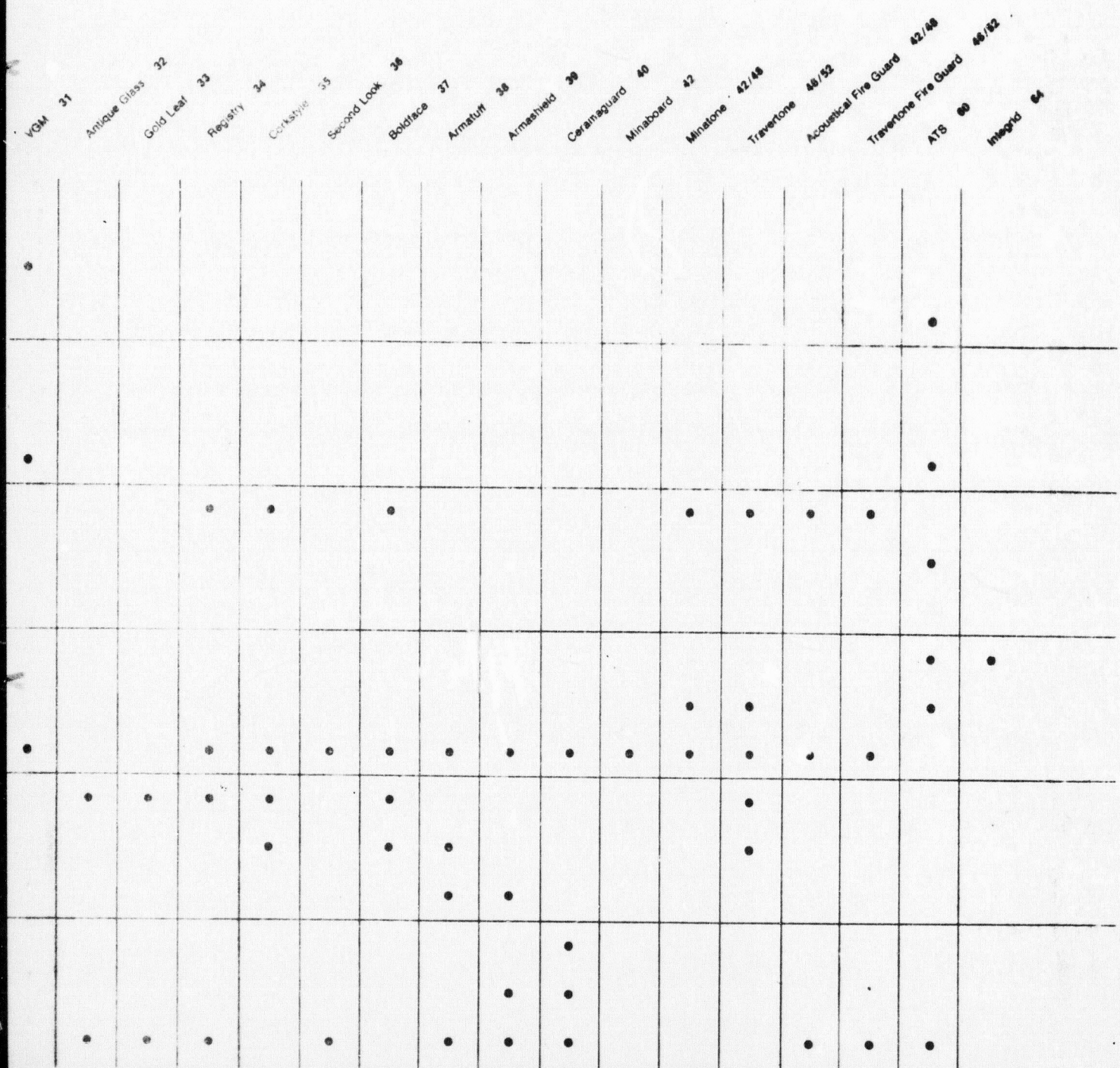
o use the chart simply select e key requirement of the iling. Enter the chart until u find the colored dot(s). en read the ceiling trade ame(s) at the top of the chart.

xample: You want a heavily xtured ceiling. Select this roperty in the list at the ft—read across to the ots—go to the top of the olumn—and you find that you an use Corkstyle, Boldface, rmatuff, or Travertone. Then neck the reference pages for omplete data on each product nd make your selection.

or a side-by-side comparison f acoustical and other roperties of all Armstrong iling products, omprehensive reference bles are printed on the four llowing pages—2, 3, 4, and 5.

Page No.		8	9	10	10	20	25	28
Armstrong Ceiling Product Brand Name		C-60/30	C-60/80	AW 3600	AW Series	Symmetry	Penatiflex	Quadratiflex
Ceiling Property								
Integrated/Vaulted		●	●	●	●		●	
Integrated/Flat			●	●	●	●	●	
Incorporates linear air diffusion		●	●	●	●	●	●	
Incorporates air return		●	●	●	●	●	●	●
Space flexibility		●				●		●
Tegular panels (reveal edge)						●		
Accommodates various light fixtures			●		●			
Accommodates HID lighting								●
Concealed suspension system							●	
Concealed accessible system								
Exposed grid system								●
Decorative surface								
Heavily textured surface								
Damage-resistant								
Moisture-resistant								
Scrubbable surface								
Fire-resistive		●	●	●	●	●	●	

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VGM 31
Antique Glass 32
Gold Leaf 33
Registry 34
Corkstyle 35
Second Look 36
Boldface 37
Armatuff 38
Armashield 39
Ceramaguard 40
Minaboard 42
Minatone 42/48
Travertone 48/52
Acoustical Fire Guard 42/48
Travertone Fire Guard 48/52
ATS 60
Integrid 64

Index/Test Data
Ceiling Systems, Designer Ceilings, Lay-in Ceilings

Armstrong

	Ceiling product	Pages	Nominal thickness	Unit size tested	Flame-spread class	Surface description	Mounting
Luminaire Systems pages 6–31	C-Series	8–19	⅝"	24" x 48"	25	Fine perforations (Classic)	7
			½"	24" x 48"	25	Nondirectional embossing (Georgian)	7
	AW-Series	10	⅝"	24" x 48"	25	Fine perforations (Classic)	7
			½"	24" x 48"	25	Nondirectional embossing (Georgian)	7
	Symmetry	20–24	½"	24" x 48"	25	Nondirectional fissures (Cortega)	7
	Pentaflex	25–27	½"	24" x 48"	25	Nondirectional fissures (Aleria)	7
	Quadraflex	28–30	½"	24" x 48"	25	Fine perforations (Classic)	7
	VGM	31	⅝"	24" x 48"	25	All Mineboard panels (see pages 42–45)	
Designer Series pages 32–36	Antique Glass*	32	⅛"	12" x 12"	25	Reflective membrane facing	7
	Gold Leaf*	33	⅛"	12" x 12"	25	Gold-colored membrane facing	7
	Registry*	34	¾"	24" x 24"	25	Five coordinated embossed designs	7
	Corkstyle	35	¾"	24" x 24"	25	Boldly textured	7
Lay-in Ceilings pages 36–49	Second Look I*	36	⅝"	24" x 48"	25	Fissured and scored	7
	Second Look II	36	⅝"	24" x 48"	25	Fissured and center scored	7
	Boldface*	37	¾"	24" x 48"	25	Rough textured, perforated	7
	Armatuff*	38	⅝"	24" x 48"	25	Nondirectional embossing, perforated	7
	Armashield*	39	⅝"	24" x 48"	25	Fine perforations	7
	Ceramaguard*	40-41	⅝"	24" x 48"	25	Fine perforations and fissures	7
Mineboard pages 42–45	Fissured	44	⅝"	24" x 48"	25	Directional fissures	7
	Classic	44	⅝"	24" x 48"	25	Fine perforations	7
			⅝"	24" x 48"	25	Ventilating panel	7
	Cortega	44	⅝"	24" x 48"	25	Nondirectional fissures	7
	Georgian	45	⅝"	24" x 48"	25	Nondirectional embossing	7
Fissurestone pages 42–45	Fissured (tegular)	44	⅝"	24" x 24"	25	Directional fissures	7
			¾"	24" x 24"	25		7
	Cortega (tegular)	44	⅝"	24" x 24"	25	Nondirectional fissures	7
			¾"	24" x 24"	25		7
Travertone pages 46–47	Fissured (tegular)	47	⅝"	24" x 24"	25	Directional fissures	7
	Sanserra (tegular)	47	¾"	24" x 24"	25	Nondirectional embossing	7
	Colomar (tegular)	47	¾"	24" x 24"	25	Nondirectional deep embossing	7
	Highspire (tegular)	47	¾"	24" x 24"	25	Nondirectional embossing	7
Acoustical Fire Guard pages 42–45	Fissured	44	⅝"	24" x 48"	25	Directional fissures	7
	Classic	44	⅝"	24" x 48"	25	Fine perforations	7
	Cortega	44	⅝"	24" x 48"	25	Nondirectional fissures	7
	Georgian	45	⅝"	24" x 48"	25	Nondirectional embossing	7
	Mylar (field unit)	45	⅝"	24" x 48"	25	Membrane facing	7
Travertone Fire Guard pages 46–47	Fissured	47	¾"	24" x 24"	25	Directional fissures	7
	Sanserra	47	¾"	24" x 24"	25	Nondirectional embossing	7

* Also available as Fire Guard items
** Fixture attenuators used

Absorption coefficients						NRC	NRC specification range	Riverbank test number	STC specification range: Continuous ceiling	STC specification range: Continuous ceiling with Artemi-Guard treatment	Geiger-Hamme test number	Weight (lb per sq ft)	C factor @ 75 F	Light reflectance
125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz									
29	29	55	75	73	57	60	55-65	A72-209		Up to 40-44**	A-142FT	.70	.55	1
25	32	68	62	48	34	55	50-60	A72-233		Up to 40-44**		.74	.55	1
29	29	55	75	73	57	60	55-65	A72-209		Up to 40-44**	A-142FT	.70	.55	1
25	32	68	62	48	34	55	50-60	A72-233		Up to 40-44**		.74	.55	1
30	35	50	62	67	71	55	50-60	A73-8		40-44**	A-119FT	.70	.55	1
39	38	56	67	73	72	60	55-65	A72-155	35-39	40-44**	A-120FT	.93	.70	1
29	29	55	75	73	57	60	55-65	A72-209		Up to 40-44**	A-142FT	.70	.55	1
33	35	56	80	76	75	65	60-70	A63-258	35-39	40-44		1.2	.70	1
33	35	56	80	76	75	65	60-70	A63-258	35-39	40-44		1.2	.70	1
40	44	60	71	83	80	60	55-65	A75-79				1.3		2
40	38	51	84	87	88	65	60-70	A75-225				.85		
34	31	45	55	60	68	50	45-55	A75-20	35-39	40-44	A-58FT	.60	.65	2
32	31	46	57	63	67	50	45-55	A75-21	35-39	40-44	A-58FT	.80	.65	2
26	31	55	81	90	89	65	60-70	A74-28		35-39 (sq. ed.) 40-44 (regular)	A-135FT A-136FT	.95	.50	2
29	27	56	68	61	56	60	55-65	A74-145		35-39	A-133FT	1.2	.65	2
23	26	58	80	74	52	60	55-65	A72-179	35-39	40-44	A-121FT	1.1	.70	1
25	28	46	71	86	83	60	55-65	A73-159	35-39	40-44	A-114FT	1.2	.70	1
30	29	57	71	71	70	55	50-60	A72-210	35-39	40-44	A-145FT	.70	.55	1
29	29	55	75	73	57	60	55-65	A72-209	35-39	40-44	A-157FT	1.18	.55	1
42	47	63	80	84	65	65	60-70	A63-266	25-29		A-32FT	1.1		1
30	35	50	62	67	71	55	50-60	A73-8	35-39	40-44	A-119FT	.70	.55	1
25	32	68	62	48	34	55	50-60	A72-233	35-39	40-44		.74	.55	1
						55	50-60		35-39	40-44		1.1	.70	1
39	35	60	69	76	85	60	55-65	A75-25	35-39	40-44		1.4	.65	1
31	34	52	87	75	68	55	50-60	A72-7	35-39	40-44		.84	.70	1
38	46	60	78	85	85	65	60-70	A66-130	35-39	40-44		1.35	.65	1
44	47	54	74	87	87	65	60-70	A75-33	35-39	40-44	A-154FT	1.4	.70	1
45	50	51	69	85	94	65	60-70	A75-31	35-39	40-44		1.3	.70	3
51	53	61	83	97	96	75	70-80	A72-2		30-34	A-139FT	1.1	.70	2
45	52	52	71	85	97	65	60-70	A75-58				1.3		4
23	29	56	75	79	84	60	55-65	A71-171	35-39	40-44		.83	.70	1
28	30	55	76	75	60	60	55-65	A75-29	35-39	40-44	A-12FT	1.1	.70	1
24	27	49	71	85	89	60	55-65	A75-24	35-39	40-44		1.0	.70	1
26	42	53	57	46	31	50	45-55	A63-258	35-39	40-44		1.1	.70	1
28	34	48	75	71	69	55	50-60	A68-10	35-39	40-44	A-18FT	1.1	.70	1
44	46	54	74	87	87	65	60-70	A75-33	35-39	40-44	A-154FT	1.2	.70	1
45	50	51	69	85	94	65	60-70	A75-31	35-39	40-44		1.3	.70	3

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Index/Test Data
Tile Ceilings, Miscellaneous Products, Installation, and Maintenance



Ceiling product		Pages	Nominal thickness	Unit size tested	Flame-spread class	Surface description	Mounting
Tile Ceilings							
Cortega		48–49					
Travertone		50–51					
	Fissured	50	⅝"	12" x 12"	25	Directional fissures	7
			¾"	12" x 12"	25		7
	Classic	50	⅝"	12" x 12"	25	Fine perforations	1
			⅝"	12" x 12"	25		7
	Cortega	50	¾"	12" x 12"	25	Nondirectional fissures	7
	Alena	50	¾"	12" x 12"	25	Nondirectional fissures	7
	Georgian	51	⅝"	12" x 12"	25	Nondirectional embossing	7
	Bold Random	51	⅝"	12" x 12"	25	Large perforations	7
Travertone		52–53					
	Fissured	53	¾	12" x 12"	25	Directional fissures	7
			¾"	12" x 12"	25	Nondirectional	7
	Fine Fissured	54	¾"	12" x 12"	25	Fine directional fissures	7
	Sonsera	54	¾"	12" x 12"	25	Nondirectional embossing	7
	Granadura	55	¾"	12" x 12"	25	Patterned embossing	7
	Cobblar	55	¾"	12" x 12"	25	Nondirectional wood embossing	7
	Highspire	55	¾"	12" x 12"	25	Nondirectional embossing	7
Acoustical Fire Guard		56–57					
	Fissured	56	¾"	12" x 12"	25	Directional fissures	7
	Mylar (field unit)	57	⅝"	12" x 12"	25	Membrane facing	7
Travertone Fire Guard		52–53					
	Fissured	54	¾"	12" x 12"	25	Directional fissures	7
	Sonsera	54	¾"	12" x 12"	25	Nondirectional embossing	7
		55	¾"	12" x 12"	25	Nondirectional embossing	7
Fire-Design Ratings	Armstrong Fire-Resistive Ceilings	58–59					
Suspended Tile System		60–62					
Miscellaneous							
Trim		63–64					
Trim-Z and Integrated Ceiling Systems		63–65					
	Burbery	65	⅛"	12" x 48"	25	Embossed design	7
	Arborloo	65	⅛"	12" x 48"	25	Nondirectional embossing	
	Chatham	65	⅛"	12" x 12"	25	Nondirectional embossing	2
Installation		66–67					
	Classic	66	½"	24" x 48"	200	Fine perforations	7
	Textured	66	$\frac{5}{16}$"	12" x 12"	200	Directional fissures	2
	Pleinhurst	66	½"	24" x 48"	200	Embossed design	7
Spacetone	Spacetone 24" OC Patch	67	1"$\frac{5}{16}$"	16" x 11½"	25	Small perforations	Special
Asbestos Board	Perforated Asbestos Board	67	$\frac{1}{16}$"	24" x 24"	25	Medium perforations 2" fiberglass blanket	Special
Installation and Maintenance		68–69					

*Sabins per unit
**Fixture attenuators used

61 a

Absorption coefficients									STC specification range						
125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	NRC	NRC specification range	Riverbank test number	Continuous ceiling	Continuous ceiling with Attenu-Guard treatment	Geiger-Hamme test number	Weight (lb per sq ft)	C factor @ 75 F	Light reflectance
.24	.37	.42	.67	.62	.67	.55	.50–.60	A70-89	35–39			1.1	.75	1
.28	.43	.67	.73	.79	.80	.65	.60–.70	A69-96	35–39	45–49	A-81FT	1.4	.65	1
.08	.21	.70	.87	.73	.53	.65	.60–.70	A73–164	35–39	40–44		.95	.70	1
.30	.32	.60	.82	.70	.41	.60	.55–.65	A73–149	35–39	40–44	A-14FT	.95	.70	1
.28	.46	.50	.76	.85	.83	.65	.60–.70	A68–130	35–39	45–49	A-81FT	1.4	.65	1
.39	.35	.53	.67	.71	.72	.60	.55–.65	A72–156	35–39	40–44	A-120FT	.93	.70	1
.44	.44	.57	.63	.63	.62	.60	.55–.65	A68–21	35–39	40–44		1.1	.70	1
.50	.64	.67	.92	.69	.69	.75	.70–.80	A64-300	35–39	40–44		1.1	.70	1
.44	.46	.54	.74	.57	.67	.65	.60–.70	A75–33	35–39	40–44	A-54FT	1.4	.70	1
.67	.68	.59	.66	.62	.62	.75	.70–.80	A61–141	27–34		A-22FT	1.0		1
.43	.45	.60	.71	.76	.75	.60	.55–.65	A68–159	35–39	40–44	A-80FT	1.2	.70	1
.45	.50	.51	.69	.63	.64	.60	.55–.65	A70–41	35–39	40–44		1.3	.70	3
.45	.47	.51	.75	.67	.76	.65	.60–.70	A74–27	35–39	40–44		1.3	.70	3
.51	.55	.63	.93	.97	.96	.75	.70–.80	A72–2		50–54	A-139FT	1.1	.70	2
.45	.52	.52	.71	.65	.97	.65	.60–.70	A75–59				1.3		4
.37	.35	.48	.64	.78	.76	.55	.50–.65	A73–153	35–39	40–44		1.2	.70	1
.33	.35	.56	.63	.70	.75	.60	.55–.65	A61–264	35–39	40–44		1.2	.70	1
.44	.46	.54	.74	.67	.67	.65	.60–.70	A75–33	35–39	40–44	A-54FT	1.4	.70	1
.45	.50	.51	.60		.64	.65	.60–.70	A75-31	35–39	40–44		1.3	.70	3
.45	.52	.52	.71	.65	.97	.65	.60–.70	A75–58				1.3		4
.38	.35	.50	.63	.62	.49	.60	.55–.65	A73-7	35–39	40–44** (interrupted)	A-124FT	.81	.70	3
						.60	.55–.65		35–39					2
.11	.60	.52	.58	.48	.39	.55	.50–.60	A70-41	35–39			.93	.70	3
.24	.28	.43	.57	.54	.50	.45	.40–.50	A70–113				.76	.75	1
.13	.50	.37	.50	.58	.54	.50	.45–.55	A68–160				.82	.70	1
.22	.29	.52	.55	.49	.44	.45	.40–.50	A67–121				.83	.75	1
0.2*	0.7*	2.0	2.2*	2.0	1.7*			A71-33				1.7		1
.52	.99	.85	.61	.64	.30	.75	.70–.80	A56-159				.30		1

Luminaire Ceiling Systems

Armstrong

Armstrong Luminaire Ceiling Systems are sophisticated and highly flexible. They combine lighting, air diffusion, fire protection, and acoustical control into a single, unified assembly. At the same time, they offer the versatility to handle these important functions in several different ways. By virtue of their integrated multifunctional design, they offer savings in both installation and operation.

When integrated with either supply- or return-air plenums, these lighting-ceiling systems exhibit significant improvement in efficiency. Up to 10% increase in light output may be realized from the cooling effects of air-handling plenums.

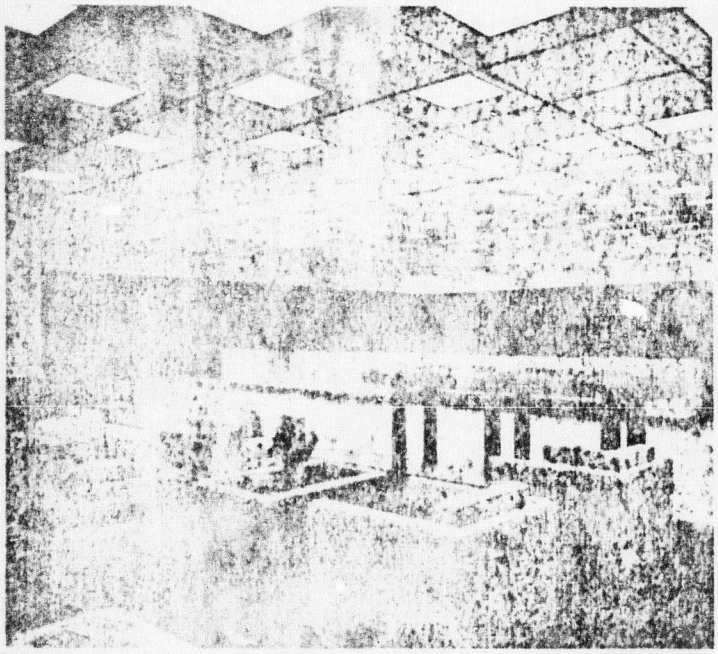
They offer the design flexibility to meet the requirements of any module, making it relatively simple to design, specify, control, coordinate, and install a dramatic, integrated ceiling in any building. These ceiling systems can put the right amount of light where it's needed, distribute conditioned air in several different ways to achieve best results, and provide up to two-hour-rated fire protection of the construction.

There are five Luminaire Ceiling Systems designed for a five-foot module but also regularly available in customized sizes to meet a variety of design requirements. Quadraflex, a system that integrates high-intensity-discharge lighting, is designed on a four-foot module.

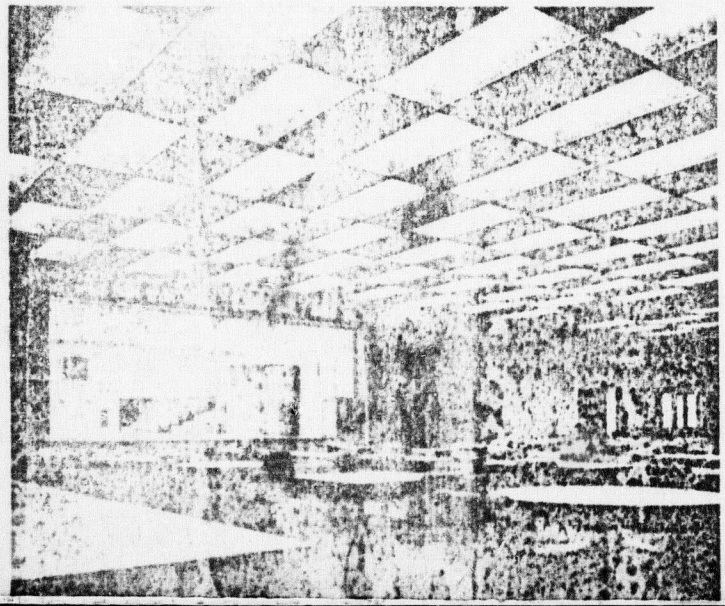
The six ceiling systems are:

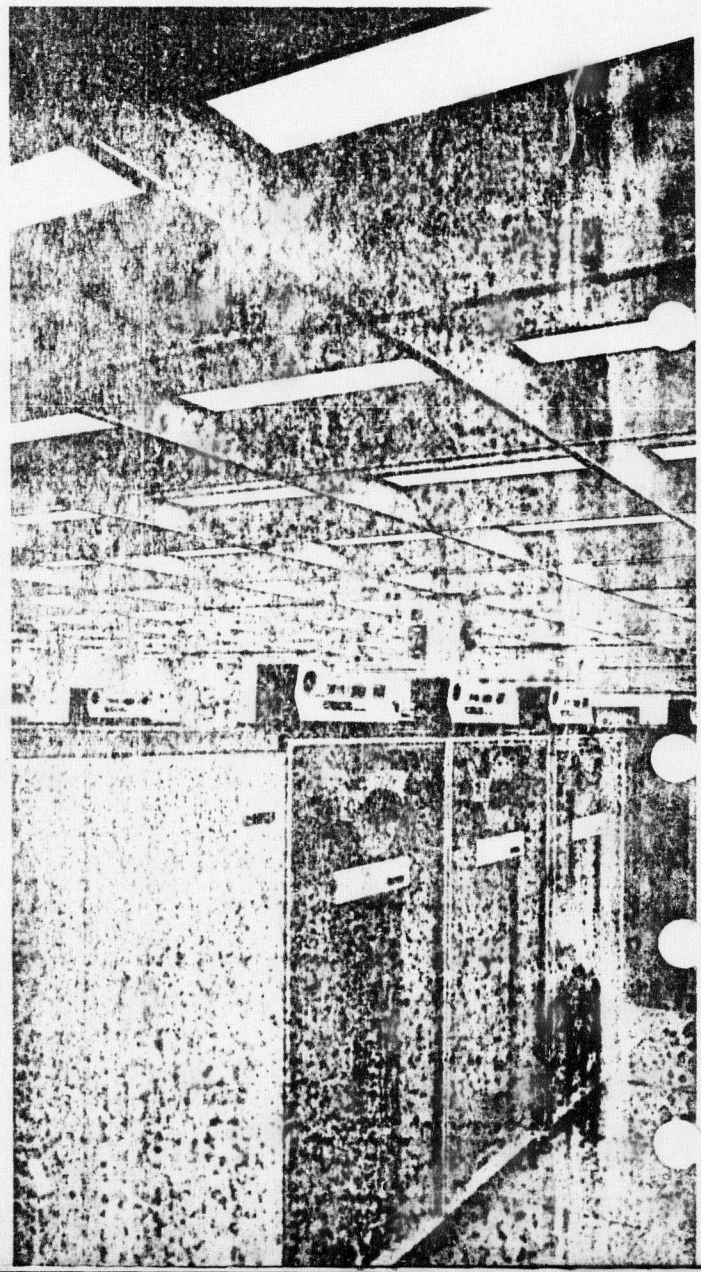
1. C-60/30 Luminaire
2. C-60/60 Luminaire
3. AW 3600 Luminaire
4. Symmetry Luminaire
5. Pentaflex Luminaire
6. Quadraflex Luminaire

All are described in this booklet, and more details in the form of technical data and drawings are available from Armstrong Representatives and Armstrong Ceiling Systems Contractors.



AW 3600





Quadraflex Luminaire

Luminaire Ceiling Systems C-Series



C-60/30

C-60/30 Luminaire is a coffered lighting-ceiling system. It is suspended on a specially designed steel grid, 2¼" wide, painted white, with a 1"-wide black recessed stripe through the center. The oblong 60" x 30" module provides a choice of ceiling (lighting) patterns coupled with a wide range of illumination. Integral lighting is by one- and two-lamp recessed fixtures with wraparound lens.

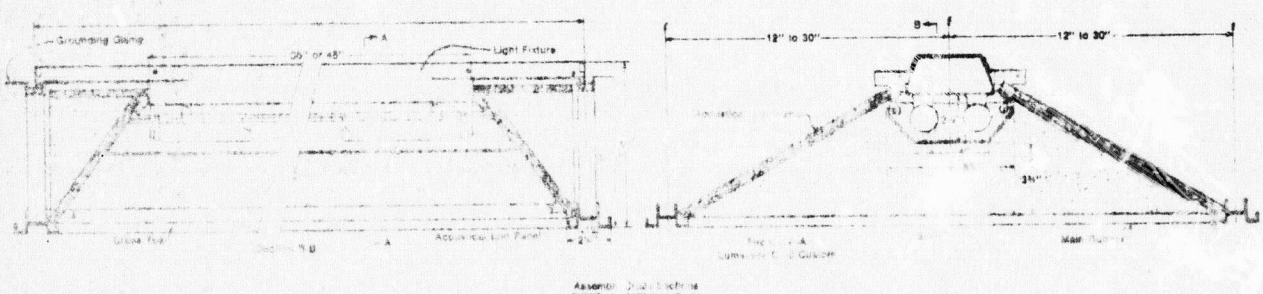
The coffered luminaire effects lighting of high quality and efficiency and at the same time affords excellent sound conditioning.

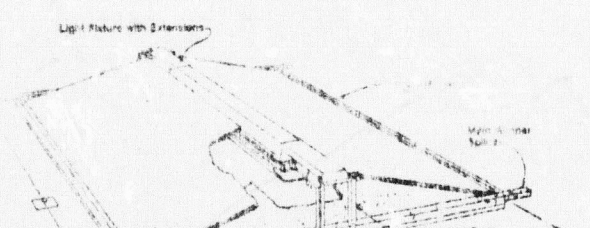
Two versions—one-lamp with standard lens, and two-lamp with special 5:1 lens—comply fully with IES Visual Comfort Criteria: Visual Comfort Probability (VCP), 5:1 or less maximum average luminance ratios, and established maximum luminance limits.

The system provides very uniform illumination of high efficiency. In most instances, candles or more may be maintained with less than four- tts-per-sq are-foot input. IES standards of uniformity are readily met with a maximum spacing to ceiling height ratio of 1:4.

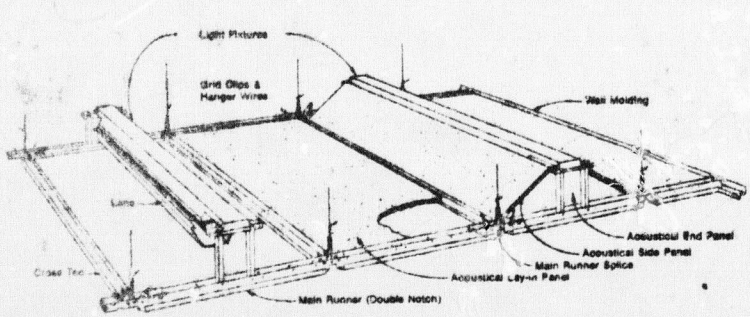
Air diffusion is by [illegible] means: (1) SALD (Supply-Air Linear Diffuser in the framing); (2) ceiling-wide ventilating (perforated) panels; (3) Supply-Air Tee (slotted tee with supply-air plenum). These same components also serve a variety of air-return functions. A number of C-60/30 designs are fire-rated.

C-60/30 Luminaire is available as a fire-rated system.





C-60/30 Luminaire Fixture Assembly



Luminaire C-60/30 Assembly

C-60/30 Custom

C-60/30 Custom is an extension of the basic C-60/30 lighting-ceiling system. Fully integrated, and utilizing most of the same components, it is furnished in modules ranging from 24" x 41" to 60" x 72" in increments of one inch. This flexibility provides compatibility with most building or planning grids. Basic Armstrong Luminaire Light Fixtures for either 36" or 48" lamps are incorporated into this system.

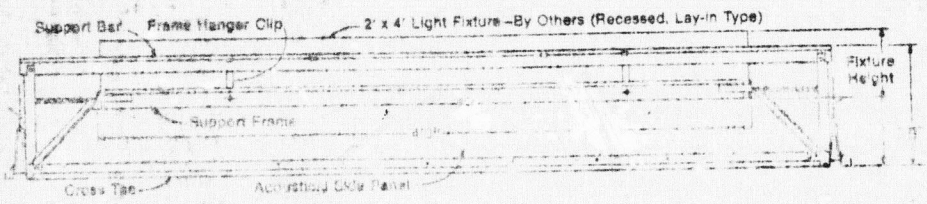
C-60/60

C-60/60 Luminaire is an integrated lighting-ceiling system based on a nominal 60"-square module. It utilizes the same steel grid and acoustical panels as the C-60/30 system but is adapted to integrate a variety of commercial recessed troffers. The result is a lighting-ceiling system of high versatility for pattern and design.

C-60/60 Luminaire is available as a fire-rated system.

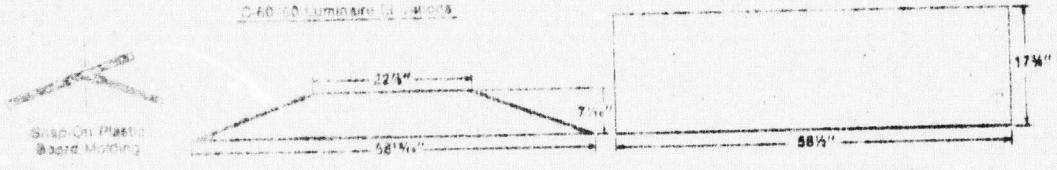
C-60/60 Custom

Depending on the choice of fixture and the design requirements, module sizes smaller or larger than the basic 60" unit can be furnished. The maximum dimension is 72" square; the minimum, 36" x 42", in increments of one inch. The depth of the vaulted module can also be varied from ½" (flat) to 9¼" to vary the visual effect of the ceiling.



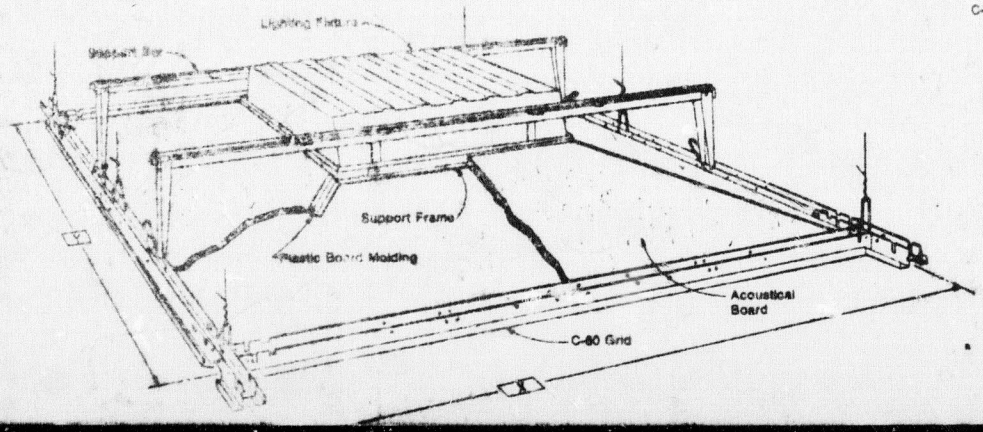
A	B
8¼"	11 15/16"
7¼"	10 15/16"
6¼"	9 15/16"
5¼" (Std.)	8 15/16"
4¼"	7 15/16"
3¼"	6 15/16"
2¼"	5 15/16"
1¼" (Flat)	4 15/16"





½" Acoustical End Panel (2) with Molding Standard Size

¾" Acoustical Side Panel (2) Standard Size



C-60/60 Custom Module Dimensions for Square Light Fixtures

2' x 2'		20" x 30"		3'2" x 3'	
X	Y	X	Y	X	Y
30"	30"	36"	36"	42"	42"

1" increments

72" 72" 72" 72" 72" 72"

AW 3600

AW 3600

Armstrong-Westinghouse Lighted Module combines the Westinghouse 36 Square recessed lighting troffer with the Armstrong C-60/60 Ceiling System. This AW 3600 Ceiling System offers a neat, trim finished appearance, highly flexible and efficient lighting characteristics, unexcelled lighting uniformity, patented air-diffusion and return-air systems, simplified installation, and easy maintenance. The lighting fixture features an extruded aluminum-trimmed square flange housing and door frame, and a regressed black reveal, all with mitered corners and all fully symmetrical. This fixture has a lighting complement of 2, 3, 4, 5, or 6 F40T12 lamps arranged in parallel for quick access and easy relamping, and provides illuminating levels from 30 to 180 footcandles in small rooms and over 300 footcandles in open spaces.

In addition, the 3- and 4-lamp modules comply fully with IES Visual Comfort Criteria: Visual Comfort Probability (VCP), 5:1 or less maximum average luminance ratios, and established maximum luminance limits. Thus, these two versions of the AW 3600 System are candidates for critical school jobs and similar applications specifying superior quality lighting.

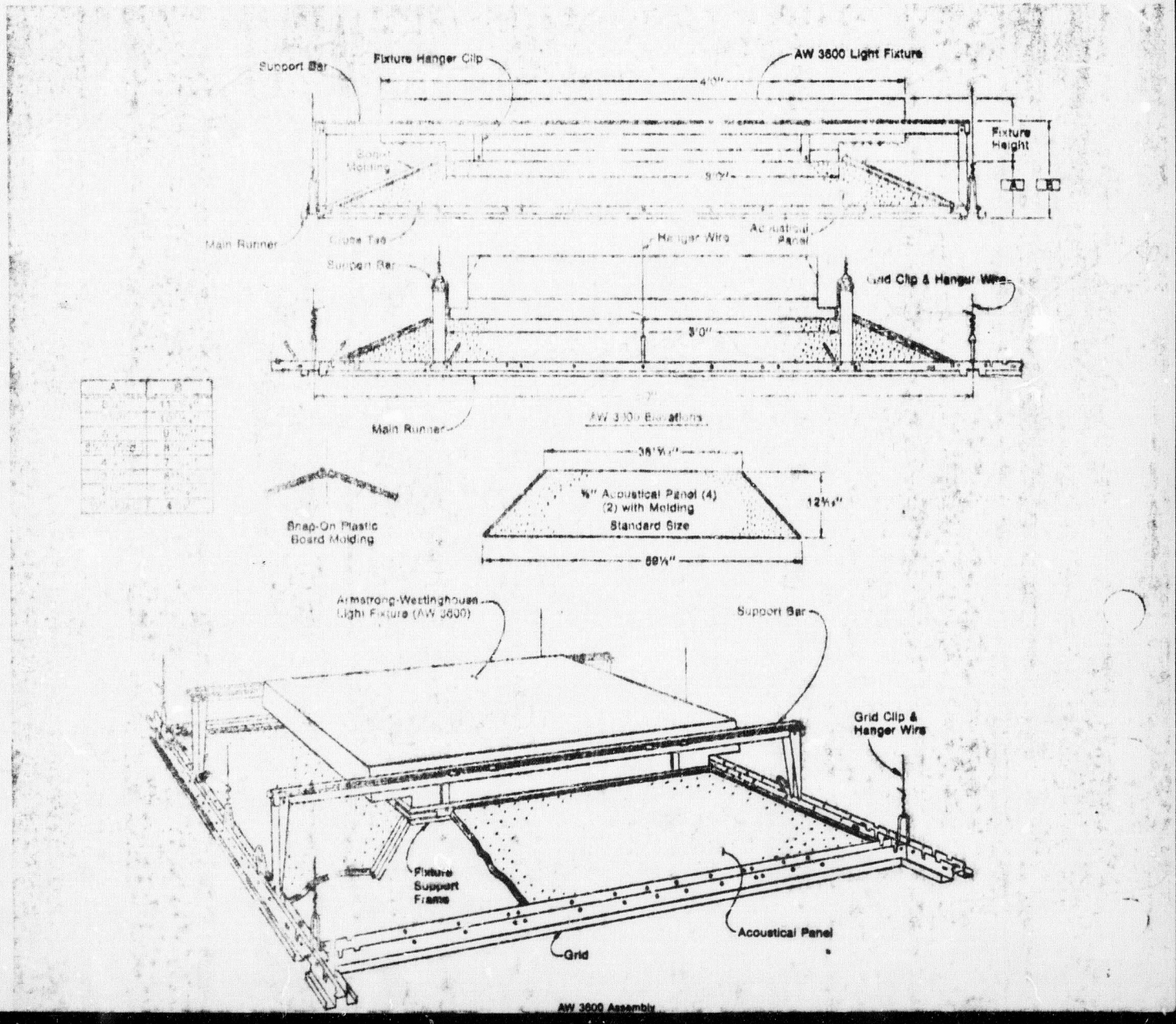
AW 3600 is available as a fire-rated system.

AW 2400/2200/1400

These new systems combine the Westinghouse AW 2′ x 4′, 2′ x 2′, and 1′ x 4′ recessed lighting troffers with the Armstrong C-60/60 Luminaire Ceiling System.

The AW 2400/2200/1400 Ceiling Systems offer a neat, trim finished appearance, highly flexible and efficient lighting characteristics, excellent lighting uniformity, patented air-diffusion and return-air systems, simplified installation, and easy maintenance.

These three systems are available as fire-rated systems.



Luminaire
Ceiling Systems
C-Series

design

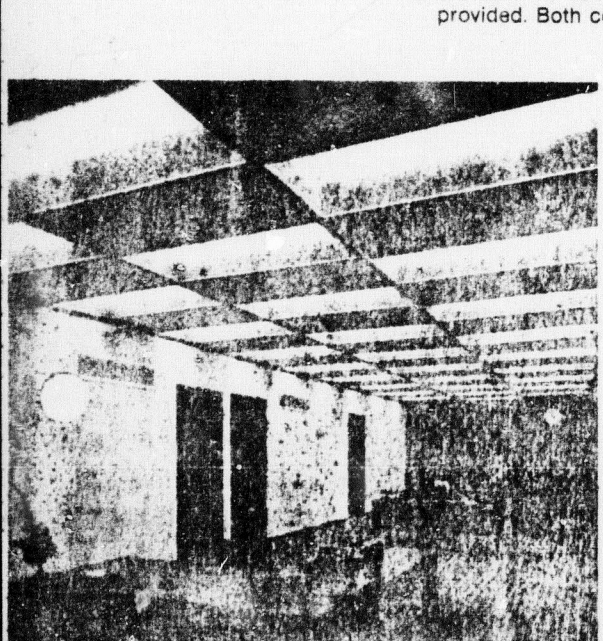
C-60/30 By using various combinations of flat and vaulted lighted modules, C-60/30 can be arranged in a wide variety of patterns. This allows wide design flexibility within the basic 60" x 60" module. Each vaulted unit is available with one- or two-tube fixtures with wrap-around lens and can provide from 30 to over 300 footcandles of efficient, high-quality lighting, with little visual glare and minimum shadow.

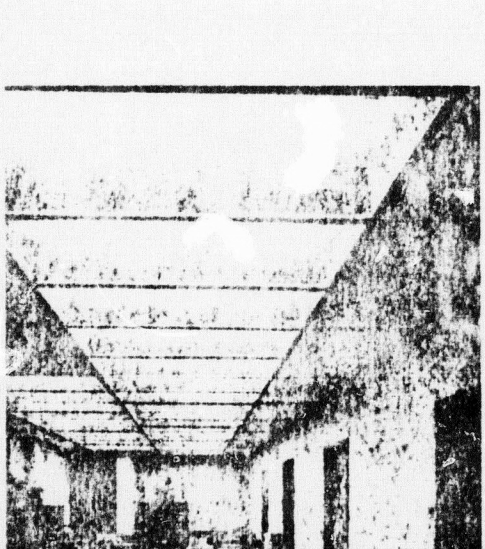
C-60/30 Custom Module sizes from a minimum of 24" x 41" to a maximum of 60" x 72" are available with C-60/30 Custom Luminaire. Smaller sizes utilize a 36" 30-watt lamp, special fixture for integrated lighting. In larger sizes, the standard 48" lamp fixture is provided. Both come with one or two lamps, for either 120- or 277-volt service.

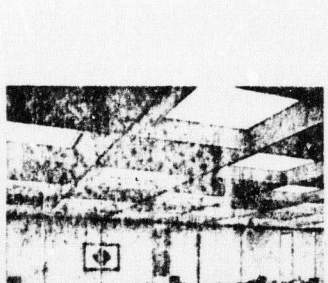
C-60/60 With this versatile system, selection can be made from standard sizes of recessed troffers. Integral lighting is by means of square troffers: 2' x 2', 30" x 30", 3' x 3', and the oblong 1' x 4' and 2' x 4' with a variety of lamp complements. Fixture support is designed to receive all commercial Type G (lay-in) fixtures including the Armstrong-Westinghouse Fixture. For design purposes, the entire module is regarded as the luminaire. Efficiency and light-distribution pattern will remain essentially the same as listed by the light manufacturer.

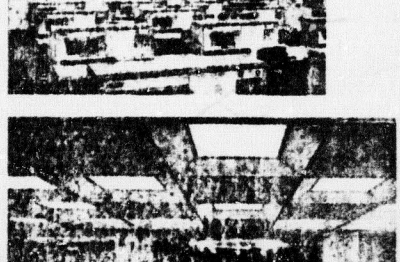
C-60/60 Custom In the customized version, the basic 60" x 60" module of this system can be reduced or enlarged. Depending on the choice of fixture, this system may be furnished in customized modules ranging from 36" x 42" to 72" square, in increments of one inch.

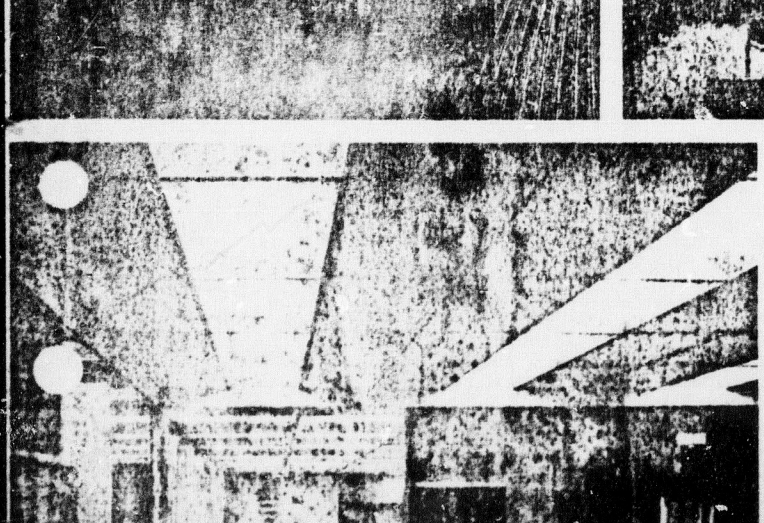
Partition Attachment The C-Series Luminaire Ceiling Systems are capable of withstanding partition loading up to 50 lb/lin ft of framing in either room direction without undue distortion or structural failure.

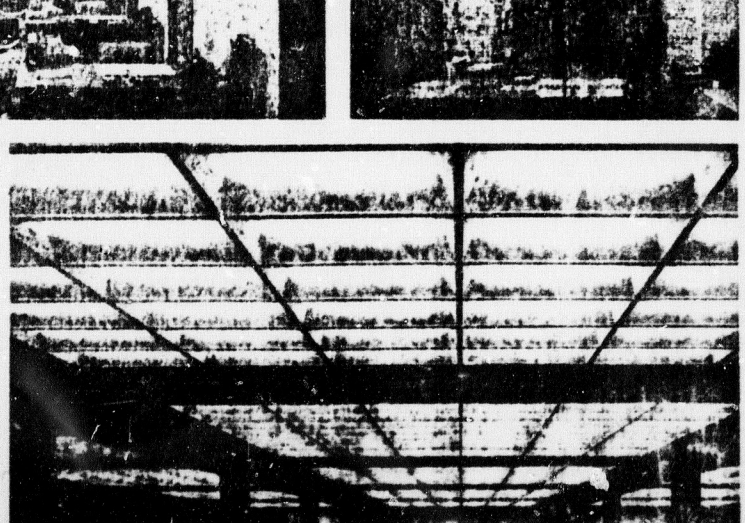












Luminaire
Ceiling System
C-Series

air diffusion and ret



The Luminaire Ceiling Systems feature the major forms of air diffusion: Ceiling-wide (ventilating ceiling); and point-source (Supply-Air Linear Diffuser-SALD); and Supply-Air Tee (supply-air plenum).

SALD
y-Air Linear Diffuser)

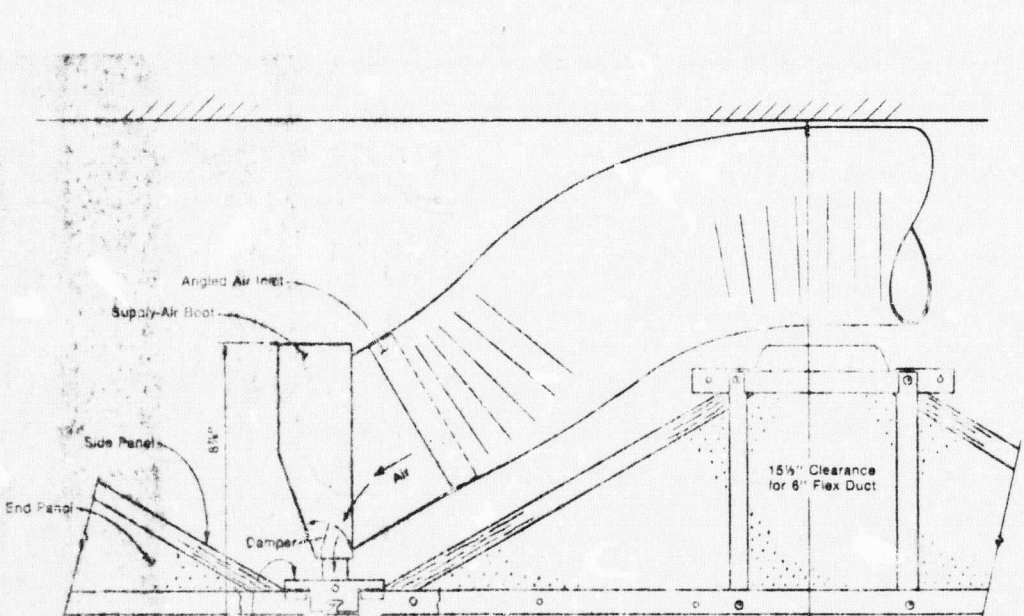
C-Series luminaire provides totally integrated system air diffusion. A linear air boot, designated SALD, fits unobtrusively into the ceiling framing and functions independently of the lighting layout.

Conventional turbulent discharge devices typically depend on high-velocity jets to effect penetration and dispersal of the air to all portions of the space to be treated. In contrast, the patented SALD air deflector diffuses the air obliquely into the space in the form of rows of small discrete jets. These SALD "minijets" effect rapid mixing and temperature equalization with a minimum of air motion.

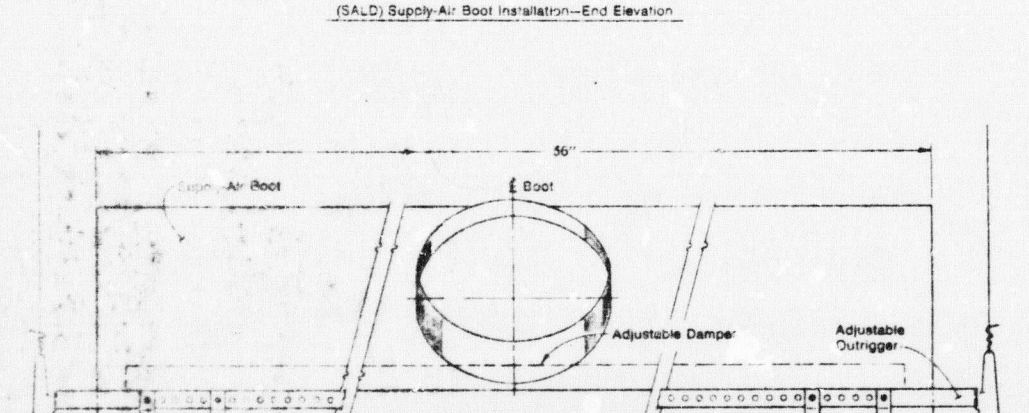
As a result of its unique design, SALD is relatively simple to lay out and requires no critical spacing. Except for the usual spacing precautions at the perimeter, almost any layout design is feasible.

Ventilating Ceiling

In the ceiling-wide method, conditioned air enters a sealed plenum through a stub duct. Air is forced under low, even pressure through thousands of perforations in the Luminaire panel and is diffused to the space below. This method of air diffusion is especially suitable for delivering large quantities of air at large temperature differentials, with minimal draft and noise.



(SALD) Supply-Air Boot Installation—End Elevation



(SALD) Supply-Air Boot Installation—Side Elevation

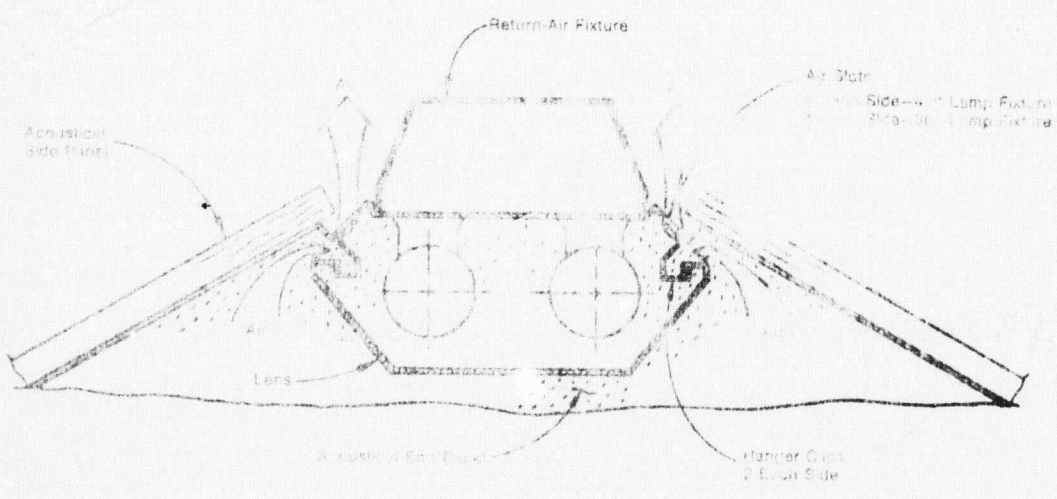
...pply-Air Tee

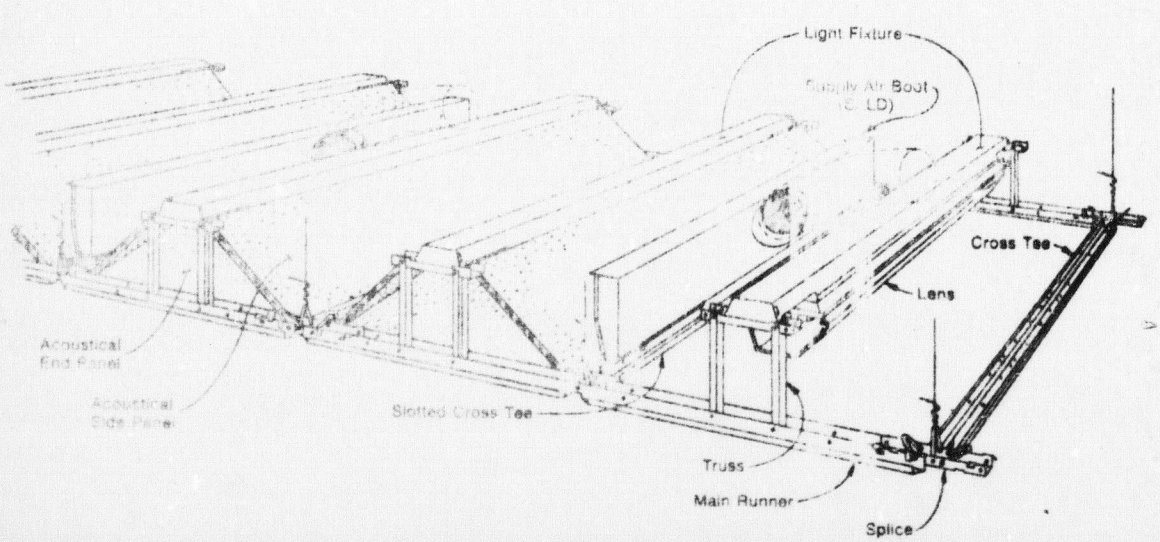
...alternate method of air ...fusion is the Supply-Air Tee ...ich does not require the use ...the air boot. As with the ...ilating Ceiling, conditioned ...nters a sealed plenum ...ough a stub duct. The air is ...en forced under low uniform ...essure through slots in the ...ming (slotted cross tee). The ...ecially designed air deflector ...fuses the air uniformly ...roughout the space. Utilizing ...e supply-air plenum, the ...pply-Air Tee offers all the ...mfort and economy features ...the Ventilating Ceiling, while ...the same time contributes a ...sirable degree of air motion. ...some cases, the Supply-Air ...e is a useful adjunct to the ...Ventilating Ceiling by augmenting air discharge in selected spaces (e.g., high cooling loads). It also eases filtration requirements.

Return-Air Lighted Module and Return-Air Tee

The Return-Air Lighted Module and Return-Air Tee offer simple but effective means of controlling and utilizing the heat of light. Both devices recover substantial portions of the unwa...d heat at the source be...re it enters the occupied zone. Thermal comfort control is thereby improved, and at the same time energy is conserved. In the typical installation, the heat ...action by these devices may range up to 80%. (Heat Removal Test Code TC-66 report available.) However, because of normal heat losses at plenum boundaries, effective heat extraction rarely exceeds 60%.

By virtue of the cooling effect on the fluorescent lamps, an increase in light output is also realized at a slight penalty of increased wattage.





Assembly with S.L.D. Air Boot

Luminaire
Ceiling Systems
C-Series

rated
ire protection

Armstrong

C-60/30 and C-60/60 Luminaire Systems can provide up to two-hour rated fire protection for both Ventilating Ceiling systems and the SALD system. Both systems are UL listed.

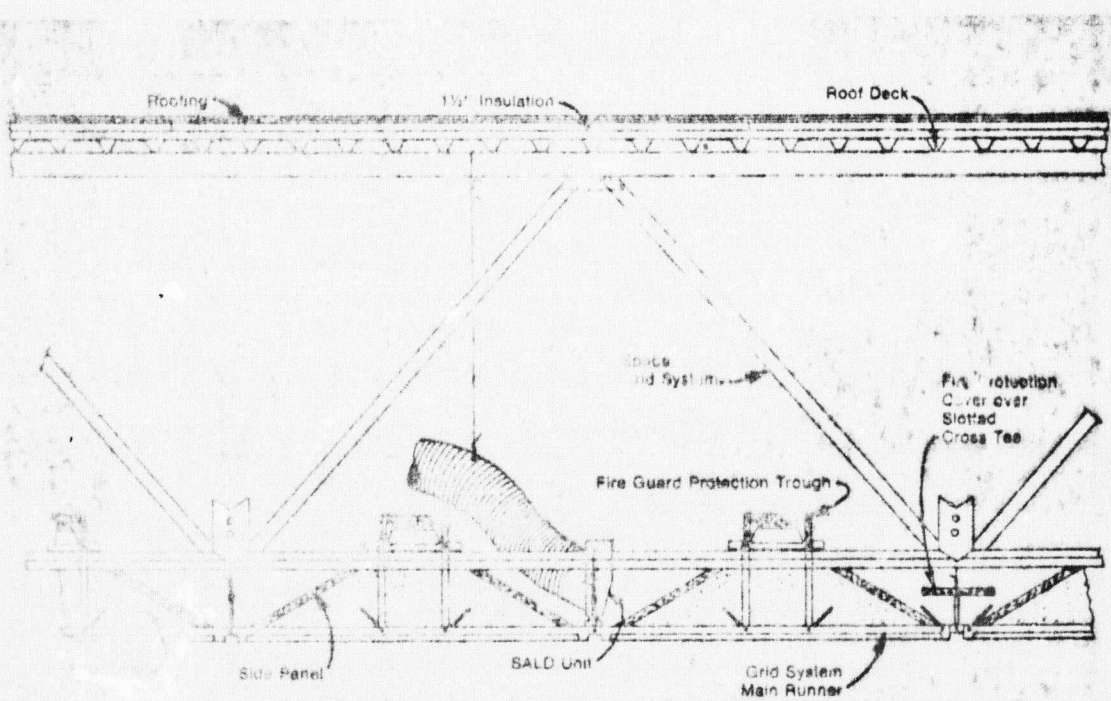
P209

Restrained-Assembly Rating—1 hr.
Unrestrained-Assembly Rating—1 hr.
Butler Space Grid, Macomber Truss System, open web bar joists
Roof:
1½" mineral-fiber roof insulation and 24-gauge fluted steel deck.
Ceiling:
Fire-rated C-60/30 Luminaire (30" x 60" flat areas allowed, SALD units included, also approved for Ventilating Ceilings).

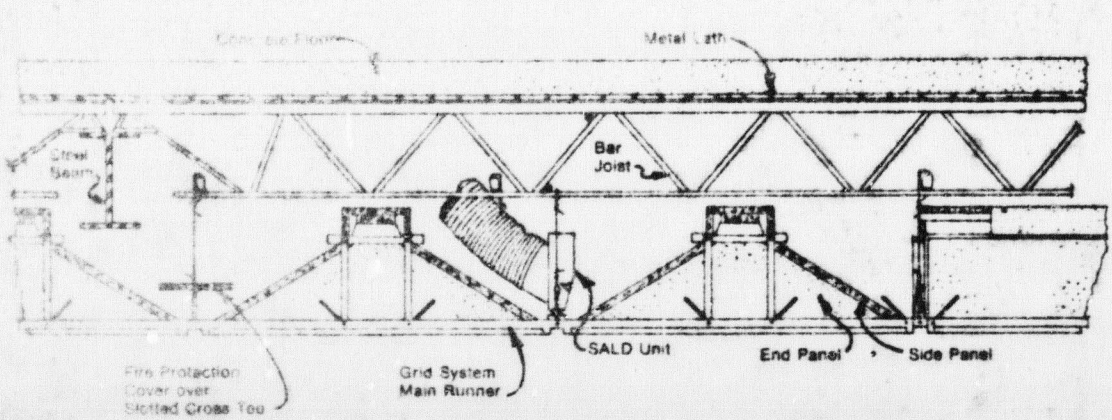
G212

Restrained-Assembly Rating—2 hr.
Unrestrained-Assembly Rating—2 hr.
Unrestrained-Beam Rating—3 hr.
Floor:
3" concrete on lath and joist, beam.
Ceiling:
Fire-rated C-60/30 Luminaire (30" x 60" flat areas allowed, approved for Ventilating Ceilings).
Ceiling:
Fire-rated C-60/60 Luminaire (24" x 24", 30" x 30", 36" x 36", 12" x 48", 24" x 48" fixtures).

P209



G212



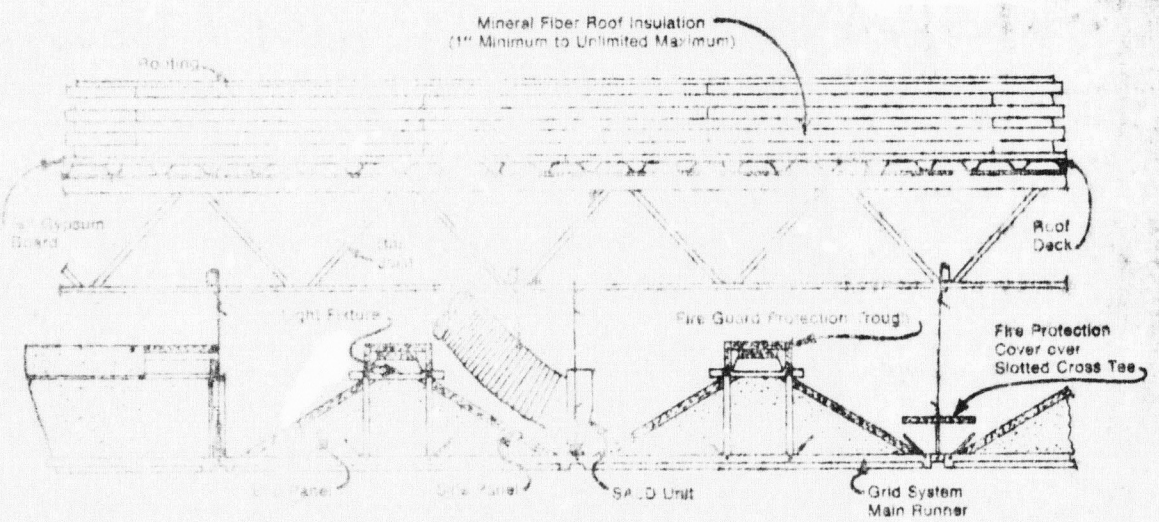
P224

Restrained-Assembly
Rating—1 hr.
Unrestrained-Assembly
Rating—¾ hr.
Roof:
mineral-fiber roof insulation (unlimited maximum) over one layer ⅝" gypsum board placed directly on steel roof deck.
Ceiling:
Fire-rated C-60/30 Luminaire 0–100% vaulted modules (C-60 fixture).
Fire-rated C-60/60 Luminaire 0–100% vaulted modules (following fixtures: 2' x 2' G, 30" x 30" G, 3' x 3' G, AW 3600, AW 1400, AW 2400).

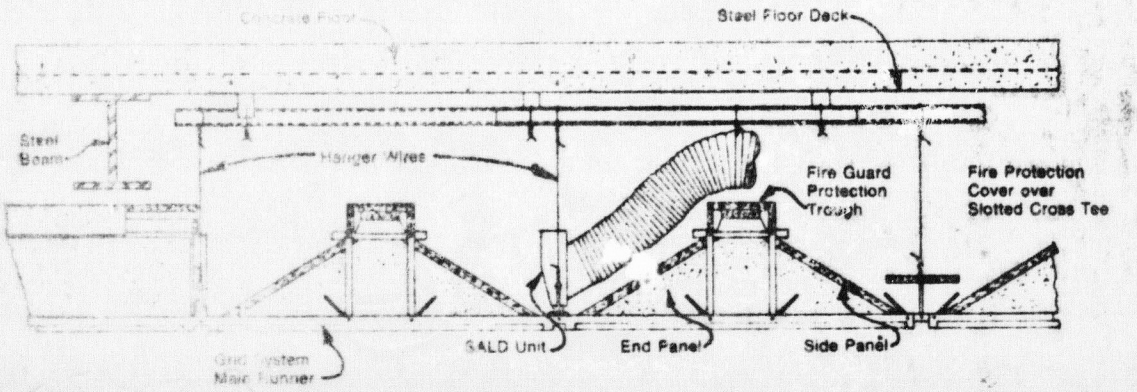
D211

Restrained-Assembly
Rating—2 hr.
Unrestrained-Assembly
Rating—1½ hr.
Unrestrained-Beam
Rating—1½ hr.
Floor:
2½" concrete on flat cellular steel deck, beam.
Ceiling:
Fire-rated C-60/30 Luminaire (30" x 60" flat areas allowed, SALD units included; also approved for Ventilating Ceilings).
Ceiling:
Fire-rated C-60/60 Luminaire (24" x 24", 30" x 30", 36" x 36", 12" x 48", 24" x 48" fixtures).

P224



D211



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Luminaire
Ceiling Systems
C-Series

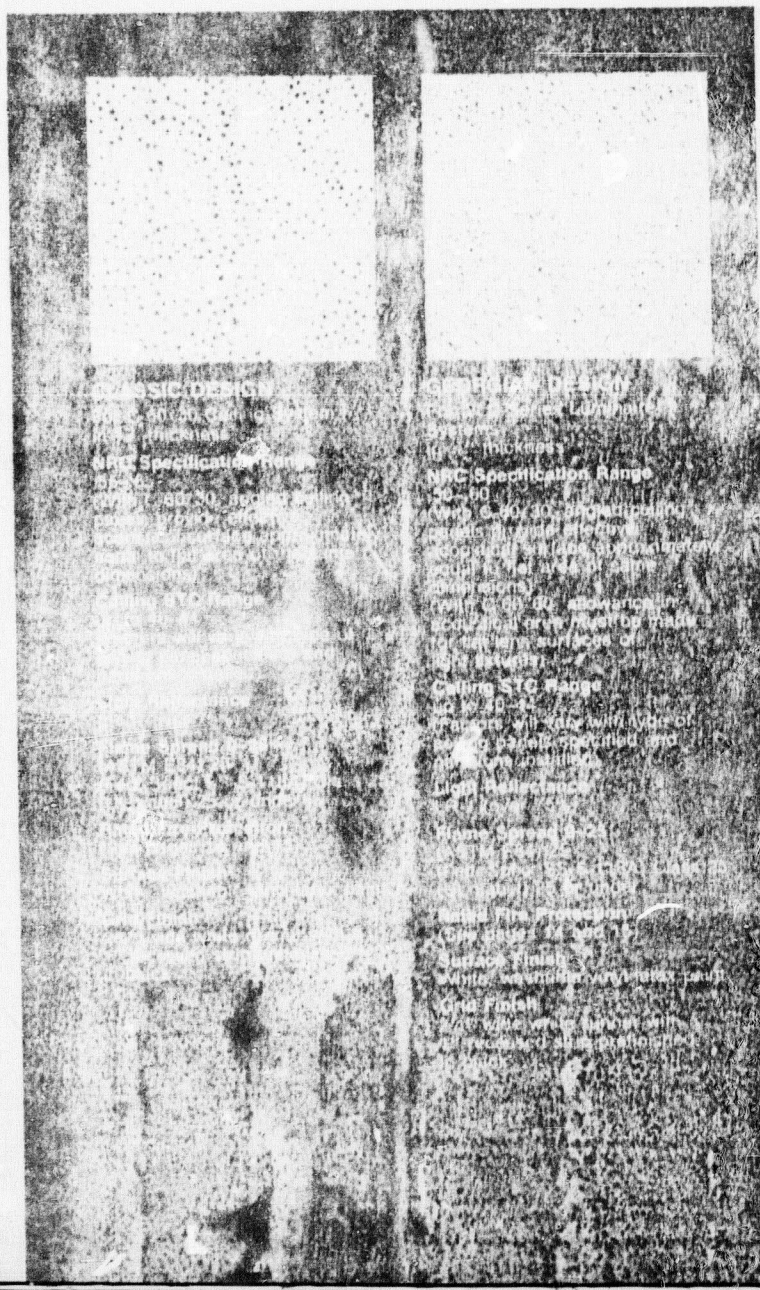
product data

Acoustical panels for installation with Luminaire Ceiling Systems are available in two standard designs—Classic, for use with C-60/30; and Georgian, for C-60/30 and C-60/60.

Armstrong

Luminaire C-Series

guide specifications



C-60/30 Luminaire Ceiling System

1. SCOPE

1.1 The ceiling shall be Armstrong C-60/30 Luminaire Ceiling System. The system shall be coffered (vaulted), lay-in, modular, and nominally 60" x 30" x 10" high. The system shall be compatible with a 5-ft planning grid.

1.2 The ceiling system shall integrate sound absorption and insulation and lighting. (Optional) The ceiling system shall also integrate air diffusion, air return, and fire protection.

1.3 The ceiling system shall comprise both coffered lighted modules and flat modules, interchangeable and turnable 90 degrees within the 30" x 60" module (5-ft planning grid).

1.4 The ceiling system shall provide concealment for all services in the plenum and access thereto, without impairment of any function.

1.5 The ceiling system shall provide detachable support for space dividers on the grid line and shall absorb horizontal loads up to 50 lb per linear foot at line of attachment. The system shall accommodate routing of services from plenum into space dividers without impairment of any function.

2. SUSPENSION

2.1 The suspension system shall be C-Series Luminaire framing. Both main and cross members shall comprise a 2¼"-wide by ½"-high reveal, with a centered 1" x ⅛"-high black regress.

2.2 The framing shall be 26-gauge galvanized steel finished on the exposed surfaces with off-white enamel.

2.3 Both main and cross members shall be notched and mitered for detachable assembly.

2.4 Wall molding shall match and detachably support the framing.

2.5 Framing shall comply with ASTM C635 Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings. Suspension system shall be classified (light) (intermediate) (heavy) duty.

3. NOISE CONTROL

3.1 Acoustical panels shall be mineral fiberboard (Type III, Federal Specification SS-S-118A) with (Classic) (Georgian) design.

3.2 The complete ceiling system as installed shall have noise-reduction coefficient (NRC) in the range (.55–.65) (.50–.60) according to ASTM C423 Sound Absorption of Acoustical Materials in Reverberation Rooms, as substantiated by independent laboratory test.

3.3 The ceiling sound-transmission class (STC) of the ceiling system shall be in the range (35–39) (40–44) according to AMA 1-II Ceiling Sound-Transmission Test by Two-Room Method, as substantiated by independent laboratory test.

4. LIGHTING

4.1 Lighting shall be integral with the ceiling system, with the lighting fixture mounted in the crown of the coffer.

4.2 The luminaire proper shall comprise both the lighting fixture and the coffered acoustical panels. Flat modules (noncoffered) shall comprise lay-in acoustical panels which shall match the coffered panels.

4.3 Acoustical panels shall have a washable matte white finish with light reflectance of LR-1 (.75 or greater) according to Federal Specification SS-S-118A.

4.4 Lighting fixtures shall be C-60/30 Luminaire nominally (48") (36") x 6½" wide.

4.5 Lighting fixtures shall be 22-gauge steel finished on the exposed surfaces with white enamel with light reflectance of at least 85%, as substantiated by independent laboratory test.

4.6 Lighting fixtures shall be demountably supported in the coffer on trusses integral with the main framing members.

4.7 Lighting fixtures shall comply with UL57, Standard for Electric Lighting Fixtures.

4.8 Luminaires (lighted modules) shall be direct type and shall comprise (one)(two) F40 fluorescent lamps.

4.9 Maximum spacing to mounting height ratio shall be 1:4.

4.10 Lenses shall be C-60/30 Luminaire (standard)(special 5:1)(twin-beam) and shall provide the following light output (lighting efficiency), as substantiated by independent laboratory test.

one-lamp, standard lens	71.5%
two-lamp, standard lens	68.5
two-lamp, special 5:1 lens	70.2
two-lamp, twin-beam lens	69.2

4.11 Lenses shall be demountably supported on hangers providing ready access to lamps and ballasts.

4.12 Lenses shall be clear acrylic plastic with a yellowness increase of not more than 3 IES-NEMA-SPI units after 1000 hours' exposure in an Atlas FDA-R Fade-Ometer, according to ASTM G23 Operating Light and Water Exposure Apparatus (Carbon Arc Type) for Exposure of Nonmetallic Materials.

4.13 Lighting layouts shall provide specified illumination levels according to utilization coefficients established by zonal cavity method, as substantiated by independent laboratory test.

4.14 Power input for 100 footcandles maintained shall not exceed 4 watts per sq ft of projected ceiling area, exclusive of special or supplementary lighting.

4.15 (Optional for one-lamp standard lens, two-lamp, 5:1, and twin-beam lens) Lighting layouts shall comply with Illuminating Engineering Society Visual Comfort Criteria, IES Handbook, 5th Edition, p. 3–26, as substantiated by independent laboratory test.

4.16 Average luminance in the 0–45 degree zone above nadir shall not exceed 750 footlamberts.

4.17 Ballasts shall be high power factor, rapid start, Class P, 60 Hertz, (120)(277) volts, UL labeled, sound-rated A, and certified by Electrical Testing Laboratories to Certified Ballast Manufacturers' standards.

4.18 Dead load of the lighted module shall be nominally 35 lb; of the flat module, nominally 15 lb.

4.19 (Optional) Air return shall be integral with the ceiling system. Air return shall be by C-60/30 Return-Air Lighted Module, effecting light output according to Air Diffusion Council Heat Removal Test Code TC66, as substantiated by independent laboratory test.

5. (OPTIONAL) AIR DIFFUSION

5.1 Air diffusion shall be integral with the ceiling system. Air diffusion shall be by Supply-Air Linear Diffuser (SALD) consisting of air boot (air manifold), slotted cross framing member (SALD cross tee), and integral air deflector (air bar).

5.2 SALD boots shall be nominally 56" x 8½" high and shall be supported in the slotted cross tee and anchored to the framing by means of brackets at each end.

5.3 SALD boots shall be 26-gauge electrogalvanized steel.

5.4 SALD boots shall be provided with (6")(8") oval duct inlet for connection to the air-distribution system.

5.5 SALD boots shall be provided with integral balancing damper adjustable from below without disturbance to any ceiling component.

5.6 SALD boots shall be (supplied with internally applied thermal insulation) (externally insulated as for connecting ductwork).

5.7 SALD air deflectors shall be two-way for normal oblique air discharge in opposite directions.

5.8 For perimeter control, SALD air deflectors shall be one-way for air discharge in one direction only.

5.9 SALD air deflectors shall be 27-gauge galvanized steel finished in black enamel to match the black regress of the slotted cross tee.

5.10 SALD air deflector shall be demountably attached to the slotted cross tee by means of spring clips.

5.11 SALD layouts shall diffuse the specified air volumes according to Air Diffusion Council Equipment Test Code 1062R3, as substantiated by independent laboratory test.

5.12 Dead load of the SALD boot, including air deflector, shall be nominally 11 lb.

guide
pecifications (cont.)

6. FIRE PROTECTION

6.1 Lenses shall comprise clear acrylic plastic having the following characteristics:

6.1.1 Burning rate of 2½" per minute according to ASTM D635 Flammability of Self-Supporting Plastics.

6.1.2 Smoke Density of 75 or less according to ASTM D2843 Measuring the Density of Smoke from the Burning or Decomposition of Plastics.

6.2 Acoustical panels shall have Flame-Spread Rating of 25 or less according to ASTM E84 Surface Burning Characteristics of Building Materials, as substantiated by independent laboratory test.

6.3 The ceiling system shall comprise Luminaire Fire Guard fire-resistant acoustical panels and shall constitute part of the following fire-rated assemblies, as classified by Underwriters' Laboratories, Inc.
Floor-Ceiling Assembly Design No. G212
Floor-Ceiling Assembly Design No. D211
Roof-Ceiling Assembly Design No. P209
Roof-Ceiling Assembly Design No. P224

6.4 The finished ceiling shall accommodate sprinkler heads at grid intersection or in flat modules.

7. INSTALLATION

7.1 Suspension system shall be installed according to ASTM C636 Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

7.2 Suspension system shall be supported by 12-gauge hanger wires nominally 30" on centers.

7.3 Hangers shall be (cast-in-place hanger wires)(percussion hanger inserts)(other).

7.4 For fire-rated installations, suspension system shall be installed according to applicable fire-rated assembly design.

7.5 Luminaires shall be installed in the framing according to reflected ceiling plans and wired, fixture-to-fixture and to junction boxes, according to National Electrical Code.

7.6 (Optional) SALD cross tees shall be installed in the framing according to HVAC plans.

7.7 (Optional) SALD and appropriate air deflectors shall be installed and connected to the air-distribution system according to HVAC plans.

7.8 Acoustical panels shall be installed according to manufacturer's recommendations.

C-60/60 Luminaire Ceiling System

1. SCOPE (Same as C-60/30 except):

1.1 The ceiling shall be Armstrong C-60/60 Luminaire Ceiling System. The system shall be coffered (vaulted), lay-in, modular, and nominally 60" x 60" x 10" high. The system shall be compatible with a 5-ft planning grid.

2. SUSPENSION (Same as for C-60/30)

3. NOISE CONTROL

3.1 Acoustical panels shall be mineral fiberboard (Type III, Federal Specification SS-S-118A) with Georgian textured design.

3.2 Acoustical panels shall have noise-reduction coefficient (NRC) in the range .50–.60 according to ASTM C423 Sound Absorption of Acoustical Materials in Reverberation Rooms, as substantiated by independent laboratory test.

3.3 The ceiling sound-transmission class (STC) of the ceiling system shall be in the range (35–39)(40–44) according to AMA 1 " Ceiling Sound Transmission Test by Two-Room Method.

4. LIGHTING

4.1 Lighting shall be integral with the ceiling system, with the lighting fixture mounted in the crown of the coffer.

4.2 The luminaire proper shall comprise both the lighting fixture and the coffered acoustical panels. Flat modules (noncoffered) shall comprise lay-in acoustical panels which shall match the coffered panels.

4.3 Acoustical panels shall have a washable matte white finish with light reflectance of LR-1 (.75 or greater) according to Federal Specification SS-S-118A.

4.4 Lighting fixtures shall be commercial lay-in (Type G) recessed troffers (2' x 2')(30" x 30")(3' x 3')(4' x 4')(1' x 4')(2' x 4')(Manufacturers' Catalog No.), as indicated on the Lighting Fixture Schedule.

4.5 Lighting fixtures shall be ( ) gauge steel finished on the exposed surfaces with white enamel with light reflectance of at least ( )".

4.6 Lighting fixtures shall be supported in the coffer on trusses integral with the main framing members.

4.7 Lighting fixtures shall comply with UL57 Standard for Electric Lighting Fixtures.

4.8 Luminaire (lighted modules) shall be direct type and shall comprise ( )( ) fluorescent lamps.

4.9 Maximum spacing to mounting height ratio shall be ( ).

4.10 Luminaires shall provide the following light output (lighting efficiency), as substantiated by independent laboratory test:

(2-lamp)	( )%
(3-lamp)	( )
(etc.)	( )

4.11 Lenses shall be hinged from either side, providing ready access to lamps and ballasts.

4.12 Lighting layouts shall provide specified illumination levels according to coefficients of utilization, as substantiated by independent laboratory test.

4.13 Power input for 100 footcandles maintained shall not exceed ( ) watts/SF of projected ceiling area, exclusive of special or supplementary lighting.

4.14 Ballasts shall be high power factor, rapid start, Class P, 60 Hertz, (120)(277) volts, UL labeled, sound-rated A, and certified by Electrical Testing Laboratories to Certified Ballast Manufacturers' standards.

4.15 Dead load of the lighted module shall be nominally ( ) lb; of the flat module, nominally 30 lb.

4.16 (Optional) Air return shall be integral with the ceiling system. Air return shall be by return-air troffer, effecting light

output according to Air Diffusion Council (ADC) Heat Removal Test Code TC66, as substantiated by independent laboratory test.

5. (OPTIONAL) AIR DIFFUSION (Same as C-60/30)

6. FIRE PROTECTION

6.1 Acoustical panels shall have flame-spread rating of 25 or less according to ASTM E84 Surface Burning Characteristics of Building Materials, as substantiated by independent laboratory test.

6.2 The ceiling system shall comprise Luminaire Fire Guard fire-resistant acoustical panels and shall constitute part of the following fire-rated assemblies, as classified by Underwriters' Laboratories, Inc.
Floor-Ceiling Assembly Design No. G212
Floor-Ceiling Assembly Design No. D211
Roof-Ceiling Assembly Design No. P224

6.3 The finished ceiling shall accommodate sprinkler heads at grid intersections or in flat modules.

7. INSTALLATION (Same as C-60/30 except):

7.5 Luminaires shall be installed in the framing according to reflected ceiling plans and wired to junction boxes according to National Electrical Code.

AW 3600 Ceiling System

1. SCOPE (Same as C-60/30 except):

1.3 The ceiling system shall comprise both coffered lighted modules and flat modules, interchangeably.

2. SUSPENSION (Same as C-60/30)

3. NOISE CONTROL (Same as C-60/60)

4. LIGHTING

4.1 Lighting shall be integral with the ceiling system, with the lighting fixture mounted in the crown of the coffer.

4.2 The luminaire proper shall comprise both the lighting fixture and the coffered acoustical panels. Flat modules (noncoffered) shall comprise lay-in acoustical panels which shall match the coffered panels.

4.3 Acoustical panels shall have a washable matte white finish with light reflectance of LR-1 (.75 or greater) according to Federal Specification SS-S-118A.

4.4 Lighting fixtures shall be Westinghouse AW 3600 recessed troffers, with nominally 36" x 36" framed lens and 3' x 4' fixture body.

4.5 Lighting fixtures shall be 22-gauge steel finished on the exposed surfaces with white enamel with light reflectance of at least 85%, as substantiated by independent laboratory test.

4.6 Lighting fixtures shall be supported in the coffer on trusses integral with the main framing members.

4.7 Lighting fixtures shall comply with UL57 Standard for Electric Lighting Fixtures.

4.8 Luminaires (lighted modules) shall be direct type and shall comprise (two) (three)(four)(five)(six) F40T12 fluorescent lamps.

4.9 Maximum spacing to mounting height ratio shall be 1:4.

4.10 Lighting fixtures shall have parallel-mounted lamps and shall provide the following light output (lighting efficiency), as substantiated by independent laboratory test:

	Output,%
(2) F40T12	62.0
(3) F40T12	58.6
(4) F40T12	57.6
(5) F40T12	55.1
(6) F40T12	53.3

4.11 Lenses shall be symmetrically framed and hinged from opposite sides, providing ready access to lamps and ballasts.

4.12 Lenses shall be clear acrylic plastic with a yellowness increase of not more than 3 IES-NEMA-SPI units after 1000 hours' exposure in an Atlas FDA-R Fade-Ometer, according to ASTM G23 Operating Light and Water Exposure Apparatus (Carbon Arc Type) for Exposure of Nonmetallic Materials.

4.13 Lighting layouts shall provide specified illumination levels according to coefficients of utilization, as substantiated by independent laboratory test.

4.14 Power input for 100 footcandles maintained shall not exceed 4.5 watts/SF of projected ceiling area, exclusive of special or supplementary lighting.

4.15 (Optional for three- and four-lamp only) Lighting layouts shall comply with Illuminating Engineering Society (IES) Visual Comfort Criteria, IES Handbook, 5th Edition, p. 3-26, as substantiated by independent laboratory test.

4.16 Ballasts shall be high power factor, rapid start, Class P, 60 Hertz (120)(277) volts, UL labeled, sound-rated A, and certified by Electrical Testing Laboratories to Certified Ballast Manufacturers' standards.

4.17 Dead load of the lighted module shall be nominally 80 lb; of the flat module, nominally 30 lb.

4.18 (Optional) Air return shall be integral with the ceiling system. Air return shall be by C-60/30 Return-Air Lighted Module, effecting light output according to Air Diffusion Council Heat Removal Test Code TC66, as substantiated by independent laboratory test.

5. (OPTIONAL) AIR DIFFUSION (Same as C-60/30)

6. FIRE PROTECTION

6.1 Acoustical panels shall have flame-spread rating of Class 25 or less according to Federal Specification SS-S-118A, as substantiated by independent laboratory test.

6.2 The ceiling system shall comprise Luminaire Fire Guard fire-resistant acoustical panels and shall constitute part of the following fire-rated assemblies, as classified by Underwriters' Laboratories, Inc.
Floor-Ceiling Assembly Design No. G212
Floor-Ceiling Assembly Design No. D211
Roof-Ceiling Assembly Design No. P224

6.3 The finished ceiling shall accommodate sprinkler heads at grid intersections or in flat modules.

7. INSTALLATION (Same as C-60/30)

Symmetry Luminaire Ceiling System

Armstrong

Symmetry Luminaire is a flat, modular 5′ x 5′ ceiling system, functionally integrated, providing acoustical control, lighting and air diffusion, with the unusual feature of easy rearrangement of the various components at future dates.

Integral lighting is by nominal 20″ x 60″ two- and four-lamp fixtures with acrylic lensing. The lens frame provides a regress for handling air return, allowing full advantage of the increased light output, reduced air-conditioning distribution system cost, and operating savings associated with return-air light fixtures.

Air diffusion is by two integral means: (1) Supply-Air Plenum/Supply-Air Bar (adjustable air-flow control bar); (2) Ducted Supply-Air Boot/Supply-Air Bar in the framing. These same components also can serve air-return functions.

Narrow (¾″) grid members of the Slide-Lock type can be easily installed and repositioned without tools at a future date.

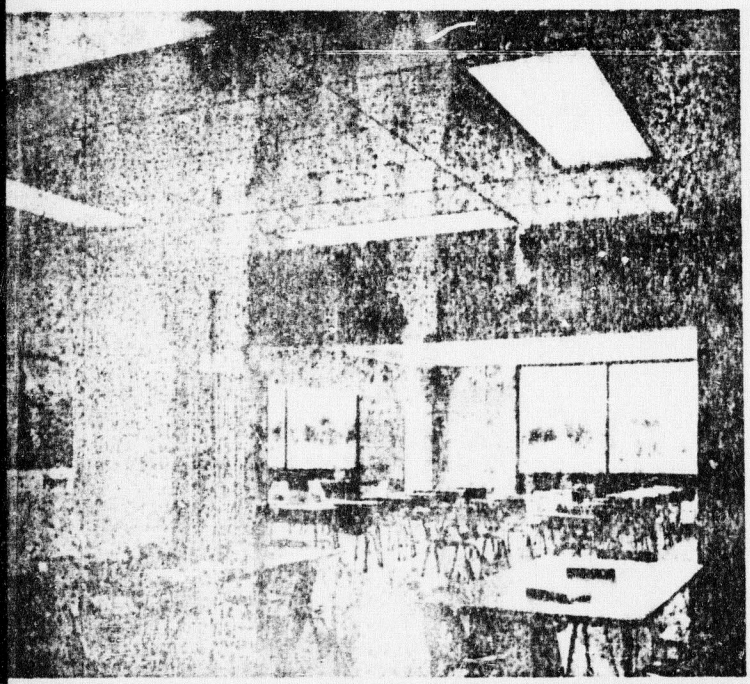
Acoustical panels are supplied with special tegular edge detail which drops the surface 3/16″ below the grid line. This feature lessens the visual impact of the grid.

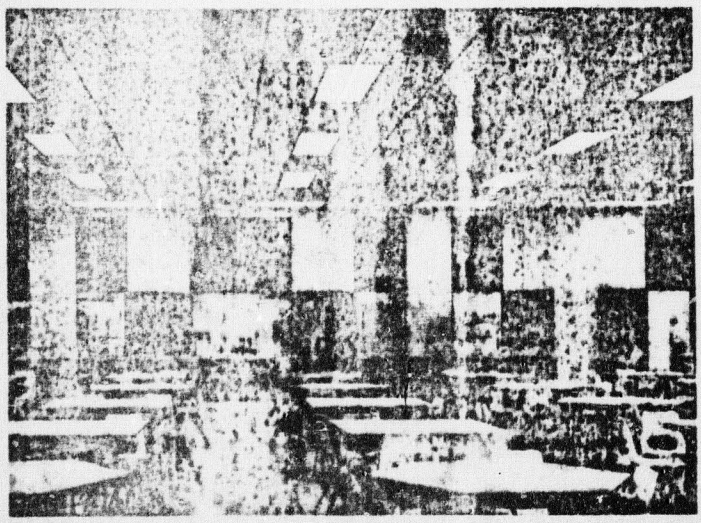
An adaptor is provided for ready attachment of partitions on the grid lines.

design

Light fixtures and acoustical panels in this system can be arranged in either direction, in staggered patterns, and with almost any combination within the 60″-square module.
To add to Symmetry's design flexibility, this system offers three light-fixture sizes: 20″ x 60″ with 2, 3, or 4 lamps and 20″ x 20″ and 20″ x 30″ with two U-Bend lamps.
Air-return feature is incorporated in the fixture, resulting in the increased light output and reduced air-conditioning cost usually associated with this feature.

Special module sizes, smaller than the standard 60″ x 60″, are available down to 48″ x 48″ in decrements of 1″.







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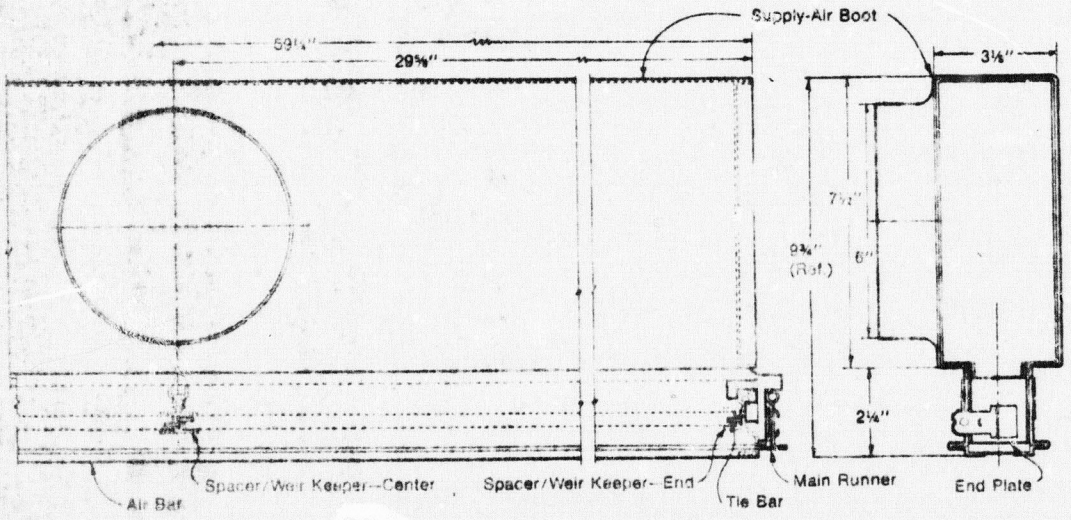
ir return
nd diffusion

The return-air troffers offer simple but effective means of controlling and utilizing the heat of light. These devices recover substantial portions of the unwanted heat at the source before it enters the occupied zone. Thermal comfort control is thereby improved, and at the same time energy is conserved. In the typical installation, the heat extraction by these devices may range up to 80%. (Heat Removal Test Code TC-66 report available.) However, because of normal heat losses at plenum boundaries, effective heat extraction rarely exceeds 60%.

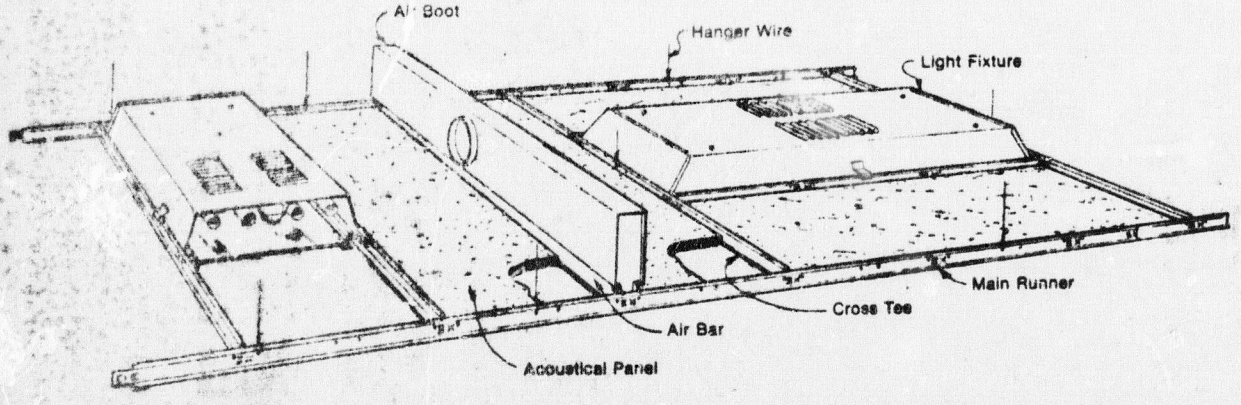
By virtue of the cooling effect on the fluorescent lamps, a substantial increase in light output is also realized at a slight penalty of increased wattage.

To assure efficient operation of these return-air devices, the plenum must be sufficiently airtight to provide the necessary negative plenum pressure. Also, the plenum should be reasonably free from obstructions; clearance at any obstruction should be at least six inches.

Two units, an air boot and an air bar, control air diffusion in the Symmetry Luminaire Ceiling System. Conditioned air enters the boot from the supply duct through flexible duct connectors. The boot rests on the air bar and distributes air evenly over the bar's entire length. The diffuser bar is equipped with a weir arrangement, adjustable from the space below. It functions both as a balancing damper and as a means of adjusting the air projection pattern from vertical through horizontal. The air bar can handle over 200 cfm without objectionable draft or noise. Boot and bar are removable.



Air Boot and Air Bar Elevations



Symmetry Assembly

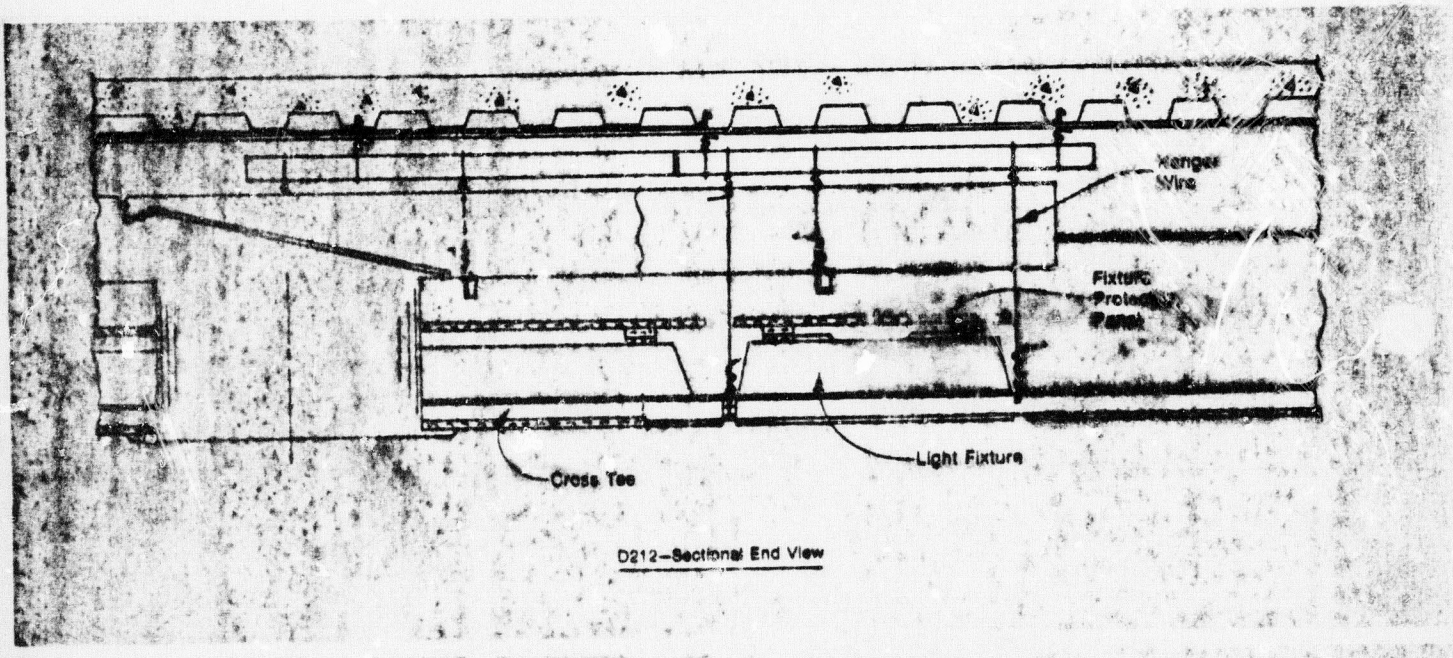
Luminaire
Ceiling Systems
Symmetry

rated
fire protection

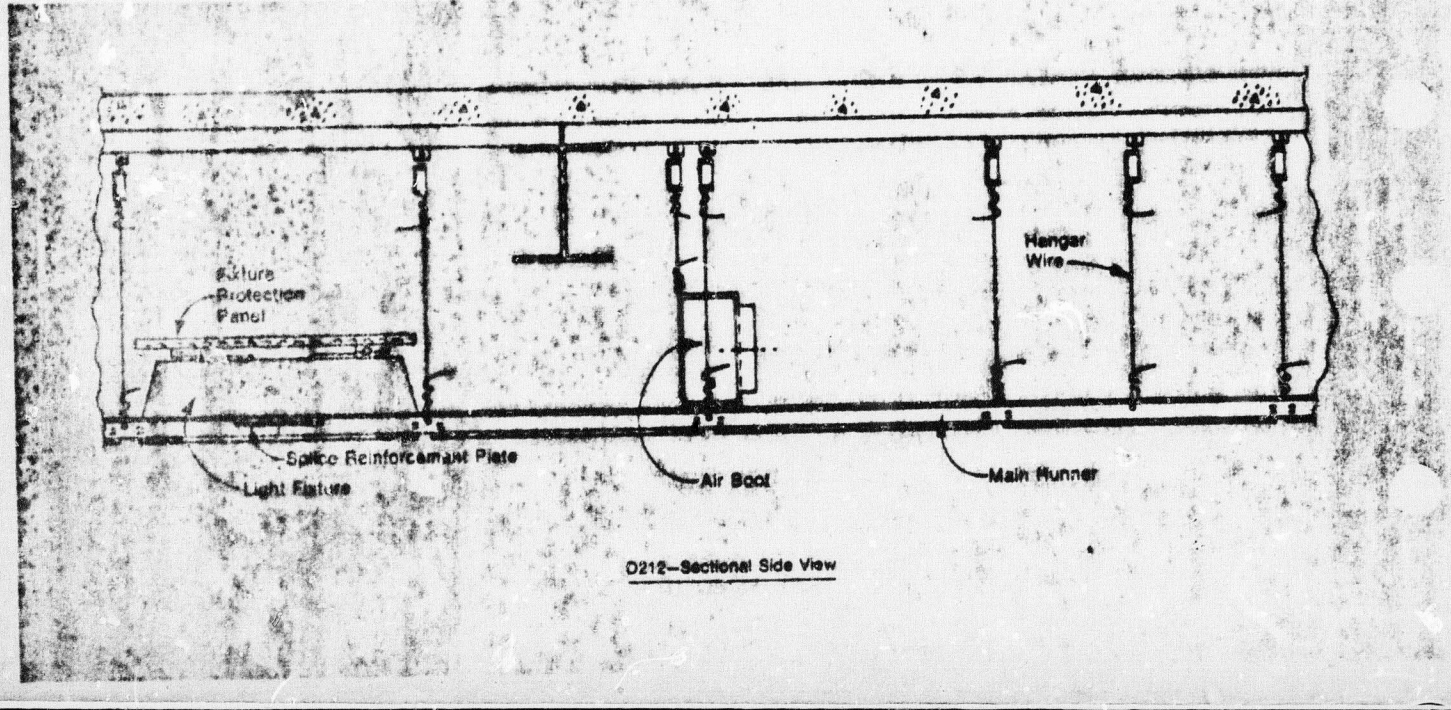
Armstrong

D212

Restrained-Assembly
Rating—2 hr.
Unrestrained-Assembly
Rating—2 hr.
Unrestrained-Beam
Rating—2 hr.
Floor:
Concrete on cellular, fluted or blend deck. Composite loading calculation allowed.
Ceiling:
Tegular Symmetry Luminaire Fire Guard. Up to 50% light fixture penetration allowed (33% with only flat board protection). Air bars or up to 127-sq-in. duct penetration per 100 sq ft allowed.



D212—Sectional End View



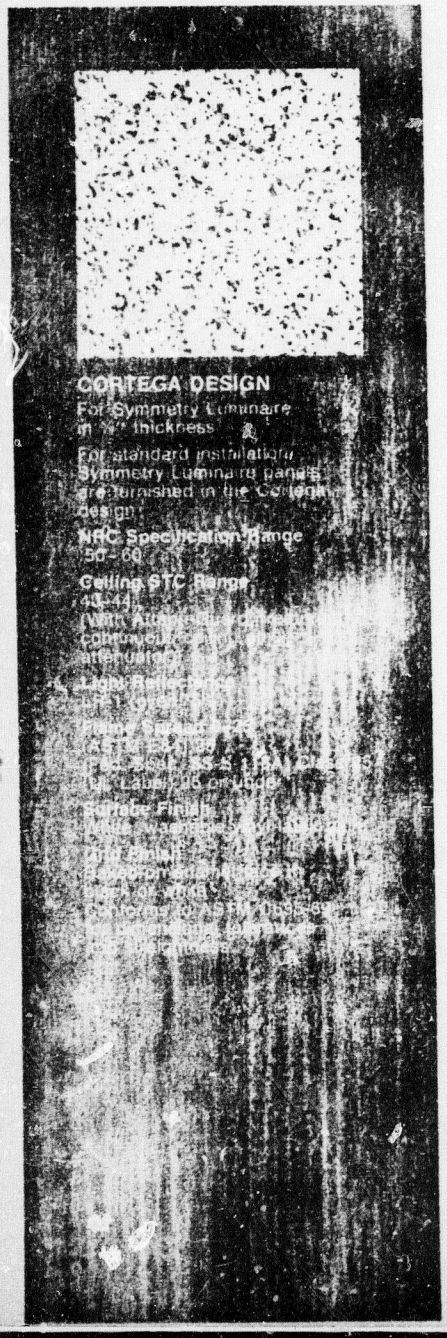
D212—Sectional Side View

Luminaire
Ceiling Systems
Symmetry

product data

guide specification

79 a



1. SCOPE

1.1 The ceiling shall be Armstrong Symmetry Luminaire Ceiling System. The system shall be lay-in, modular and nominally (60" x 20" x 5¼" high. The system shall be compatible with a 5-ft planning grid.

1.2 The ceiling system shall integrate sound absorption and insulation and lighting. (Optional) The system shall also integrate air diffusion and air return.

1.3 The ceiling system shall comprise both lighted modules and acoustical modules, interchangeable and turnable 90 degrees within the 5-ft planning grid.

1.4 The ceiling system shall provide concealment for all services in the plenum and access thereto, without impairment of any function.

1.5 The ceiling system shall provide detachable support for space dividers on the grid line.

2. SUSPENSION

2.1 The suspension system shall be Symmetry Luminaire framing. Both main and cross members shall be ¾" wide x 1½" high, finished on the exposed surfaces with (off-white) (black) enamel.

2.2 Framing shall be 27-gauge galvanized steel.

2.3 Cross members shall be provided with locking tongues extending at right angles in opposite directions from each end. Locking tongues shall slide into holding tabs on main members 20" on centers. Locking tongue shall be detachably locked to main member by means of locking dimple on main member which shall engage hole in tongue. Cross members shall also be provided with identical tabs and locking dimples 20" on centers for 90-degree installation.

2.4 Wall molding shall match and detachably support the framing.

2.5 Framing shall comply with ASTM C635 Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

3. NOISE CONTROL

3.1 Acoustical panels shall be mineral fiberboard (Type III, Federal Specification SS-S-118A), with Cortega design.

3.2 Acoustical panels shall have ¼" x ¼" Tegular edge which shall position the panel ¾" below the framing.

3.3 Acoustical panels shall have a noise-reduction coefficient (NRC) in the range .50-.60 according to ASTM C423 Sound Absorption of Acoustical Materials in Reverberation Rooms, as substantiated by independent laboratory test.

3.4 The ceiling sound-transmission class (STC) of the ceiling system shall be in the range (35-39) (40-44) according to AMA 1-II Ceiling Sound-Transmission Test by Two-Room Method, as substantiated by independent laboratory test.

4. LIGHTING

4.1 Lighting shall be integral with the ceiling system. Lighting shall be by Symmetry lay-in recessed troffers (Type G) nominally (20" x 60") (20" x 30") (20" x 20").

4.2 Acoustical panels shall have a washable matte white finish with light reflectance of LR-1 (.75 or greater) according to Federal Specification SS-S-118A.

4.3 Lighting fixtures shall be 22-gauge steel finished on the exposed surfaces with white enamel with light reflectance of at least 85%, as substantiated by independent laboratory test.

4.4 Lighting fixtures shall comply with UL57 Standard for Electric Lighting Fixtures.

4.6 Lighting fixtures shall be direct type and shall comprise (two) (four) F40 fluorescent lamps.

4.7 Light output (lighting efficiency) shall be as follows, as substantiated by independent laboratory test:

two-lamp	68.5%
four-lamp	66.9

naire
ng Systems
metry

fication

Maximum spacing to mounting height (S/MH) shall be 1.3.

Lenses shall be symmetrically framed hinged at each long side, providing dy access to lamps and ballasts.

Lenses shall be clear acrylic plastic minally .110" thick with a yellowness ease of not more than 3 IES-NEMA-SPI s after 1000 hours' exposure in an s FDA-R Fade-Ometer, according to TM G23 Operating Light and Water osure Apparatus (Carbon Arc Type) for osure of Nonmetallic Materials.

Lighting layouts shall provide cified illumination levels according to zation coefficients according to zonal ity method, as substantiated by pendent laboratory test.

Power input for 100 footcandles ntained shall not exceed 4 watts/SF projected ceiling area, exclusive of cial or supplementary lighting.

Ballasts shall be high power factor, id start, Class P, 60 Hertz, (120)(277) s, UL labeled, sound-rated A, and tified by Electrical Testing Laboratories Certified Ballast Manufacturers ndards.

Dead load of the lighted module shall nominally 36 lb; of the acoustical dule, nominally 7 lb.

(Optional) Air return shall be integral n the ceiling system. Air return shall be standard Symmetry Return-Air Troffer, ecting light recovery according to cified return-air volume, Noise Criteria C), and Static Pressure according to Air fusion Council Heat Removal Test Code 66, as substantiated by independent oratory test.

(Optional) AIR DIFFUSION

Air diffusion shall be integral with the ling system. Air diffusion shall be by mmetry Air Diffuser consisting of air ot (air manifold) and integral air bar.

Air boots shall be nominally 56" x 8" h and shall be supported in the air bar.

Air boots shall be 25-gauge dvanized steel.

5.4 Air boots shall be provided with 6"-round duct inlet centered on one side.

5.5 Air bars shall be nominally 60" x 1¾" wide and shall be supported in the framing.

5.6 Air bars shall be 20 gauge galvanized steel finished on the exposed surfaces with off-white enamel, air slot, black enamel.

5.7 Air bars shall be provided with weir adjustable from below without disturbance of any ceiling component.

5.8 Air bars shall provide weir adjustment for normal two-way horizontal air projection in opposite directions.

5.9 For perimeter control, air bars shall provide weir adjustment for one-way horizontal air projection.

5.10 Air bars shall provide weir adjustment for vertical air projection.

5.11 Air bars shall provide weir adjustment for air balancing.

5.12 Air bars shall be provided with ⅜" splines along each side for engagement with kerfed acoustical panel.

5.13 Air diffuser layouts shall diffuse the specified air volumes according to specified Room Air Velocity, Noise Criteria (NC), and Static Pressure Criteria, according to Air Diffusion Council Equipment Test Code, as substantiated by independent laboratory test.

5.14 Dead load of air boot including air bar shall be nominally 14½ lb.

6. FIRE PROTECTION

6.1 Lenses shall comprise clear acrylic plastic having the following characteristics:

6.1.1 Burning rate of 2½" per minute according to ASTM D635 Flammability of Self-Supporting Plastics.

6.1.2 Smoke Density of 75 according to ASTM D2843 Measuring the Density of Smoke from the Burning or Decomposition of Plastics.

6.2 Acoustical panels shall have Flame-Spread Rating of Class 25, according to Federal Specification SS-S-118A, as substantiated by independent laboratory test.

6.3 The ceiling system shall comprise Luminaire Fire Guard fire-resistant acoustical panels and shall constitute part of the following fire-rated assemblies, as classified by Underwriters' Laboratories, Inc., Floor-Ceiling Assembly Design No. D212.

7. INSTALLATION

7.1 Suspension system shall be installed according to ASTM C636 Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

7.2 Suspension system shall be supported by 12 gauge hanger wires nominally 5 ft on centers, except that the lighted modules shall be supported at the four corners.

7.3 Hangers shall be (cast-in-place hanger wires) (percussion hanger inserts) (other acceptable hanger means).

7.4 Troffers shall be installed in the framing according to reflected ceiling plans and wired to junction boxes according to National Electrical Code.

7.5 (Optional) Air diffusers shall be installed in the framing according to HVC plans.

7.6 Acoustical panels shall be installed according to manufacturer's recommendations.

BEST COPY AVAILABLE

Pentaflex Luminaire Ceiling System

Pentaflex is an integrated Luminaire Ceiling System that combines lighting, air handling, acoustical control and interior decorative finish in a flat, monolithic configuration.

Based on the practical and efficient five-foot module, Pentaflex combines 20" x 48" ceiling panels with 1' x 4' lighting fixtures. The result is a crisp, uncluttered aspect, free of exposed gridwork, with a minimum of tile joint lines.

Lighting fixtures for Pentaflex are 2-lamp or 3-lamp F40 units supplied by Westinghouse.

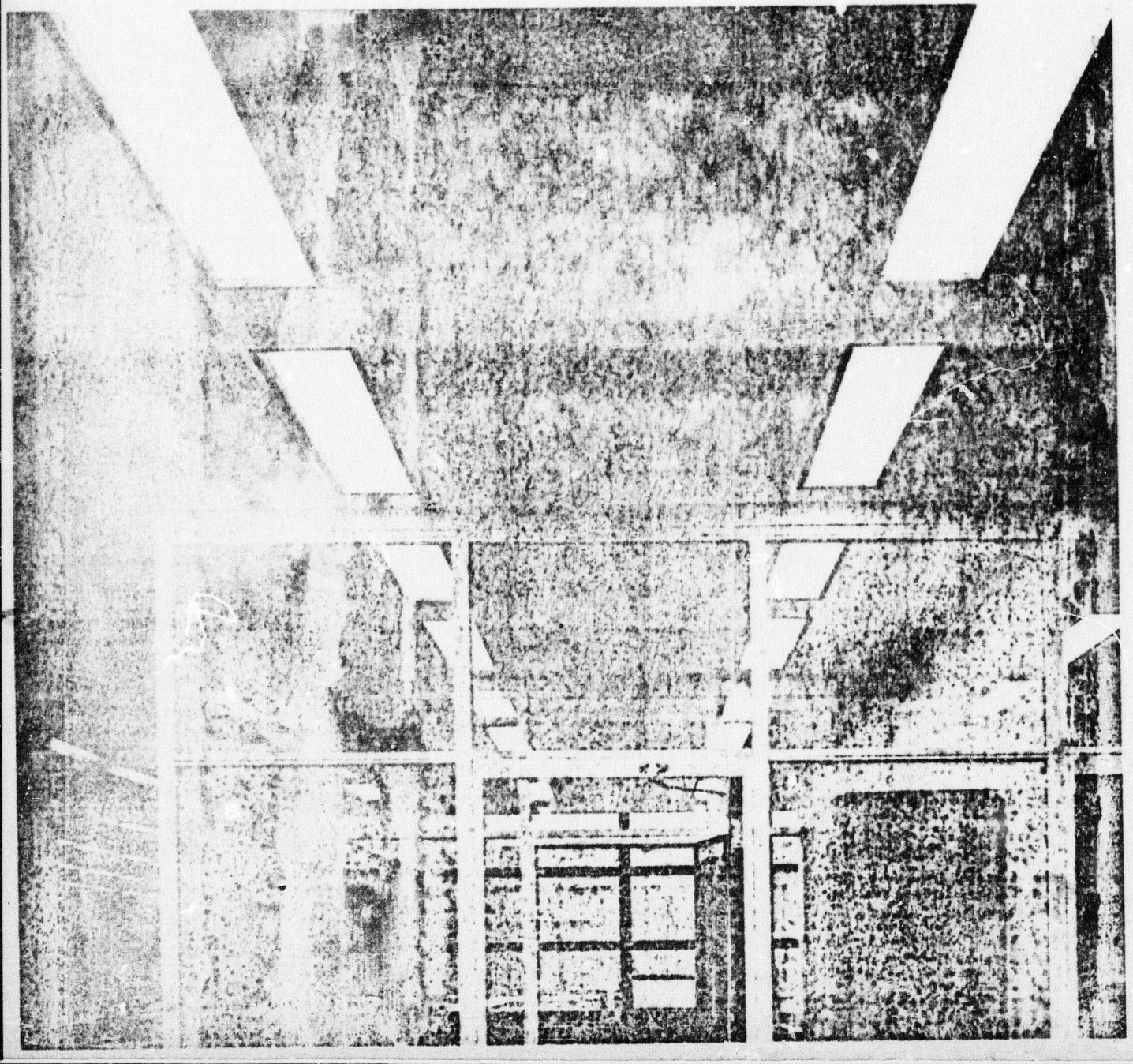
An important Pentaflex feature is convenient access to the plenum. One-third of the ceiling panels are fully accessible—allowing over six square feet of access per module.

Air Diffusion—Lighting fixtures used in the Pentaflex Luminaire Ceiling System can be fitted with commercially available double-side or single-side supply-air diffusers.

Diffusers feed from the side inlet for use with 5"- or 6"-round duct. Typically, each side of diffuser has individual, fully adjustable air pattern and volume controller.

Air Return—Air return is either through fixture end slots into the plenum via the lamp cavity or through side slots directly into the plenum. Air return is controlled by dampers in the fixture or by covering the slots.

Energy Distribution—Returning air through the lamp cavity can add up to 20% to the light output of the module.



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...ing Systems
...ntaflex

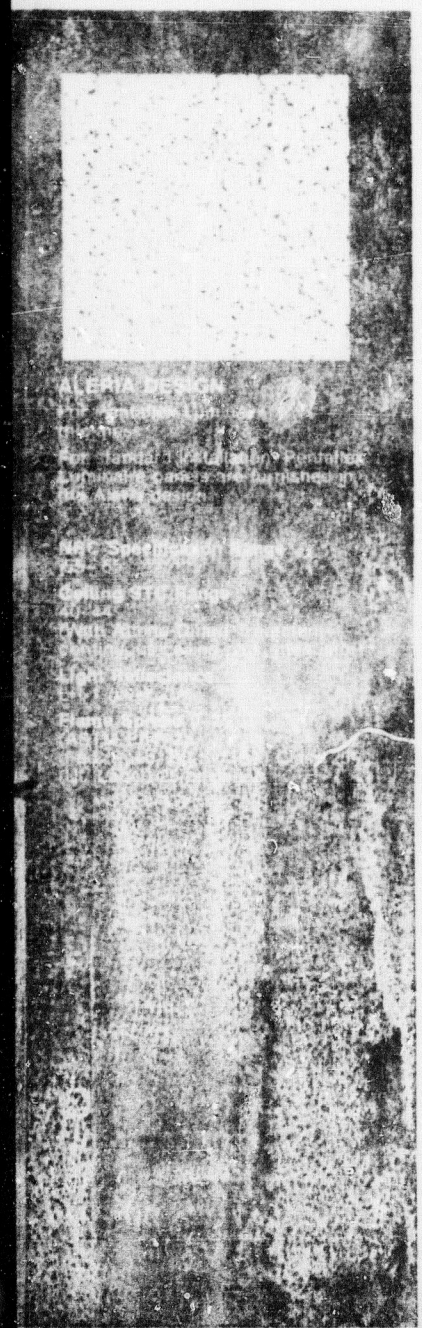
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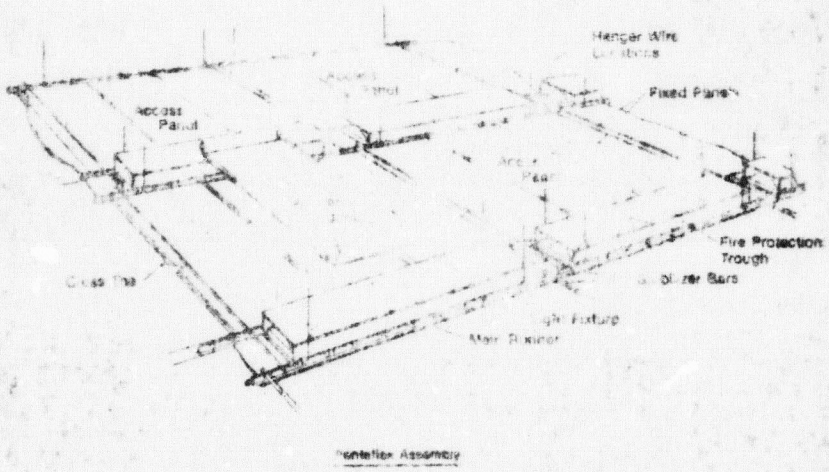
Armstrong

rated fire protection

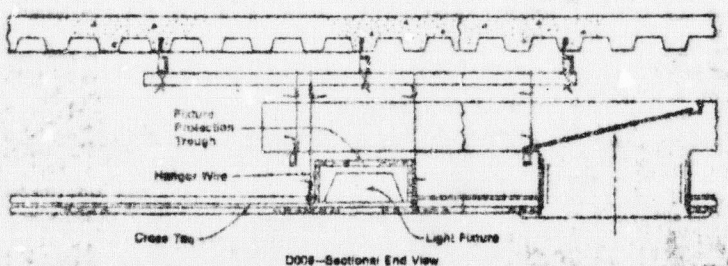
D008
Restrained-Assembly Rating—2 hr.
Unrestrained-Assembly Rating—2 hr.
Unrestrained-Beam Rating—3 hr
Floor:
2½" concrete on fluted, cellular, or blend deck.
Composite loading calculation allowed
Ceiling:
Pentaflex Luminaire Fire Guard. Up to one lighting fixture per module allowed.

Restrained-Assembly Rating—3 hr.
Unrestrained-Assembly Rating—3 hr.
Unrestrained-Beam Rating—3 hr.
Floor:
3¼" concrete on fluted, cellular, or blend deck.
Composite loading calculation allowed.
Ceiling:
Pentaflex Luminaire Fire Guard. Up to one lighting fixture per module allowed.

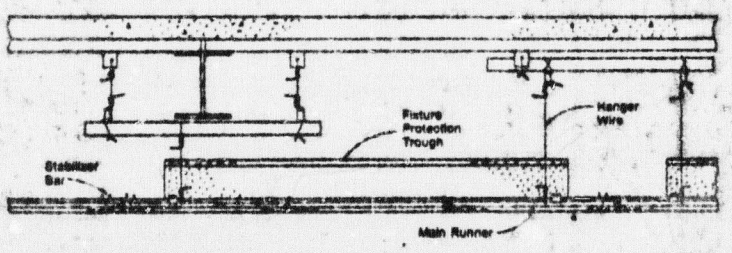




Pentaflex Assembly



D008—Sectional End View



D008—Sectional Side View

Guide Specification

1. SCOPE

1.1 The lighting-ceiling system shall comprise Armstrong Pentaflex Ceiling System with Westinghouse 1' x 4' luminaires. The lighting-ceiling system shall be a flat, modular system on a nominally 5' planning grid.

1.2 The lighting-ceiling system shall provide noise control.

1.3 The lighting-ceiling system shall provide concealment and passage for structural, electrical, HVAC, and other services.

1.4 The lighting-ceiling system shall acknowledge and accommodate the requirements of the electric-electronic, HVAC, interior partitions, and structural subsystems.

1.5 Acoustical panels shall have washable matte white finish with light reflectance of LR-1 (.75 or greater) according to Federal Specification SS-S-118A.

1.6 If alternate methods are proposed in total or substitution of any one of the components of lighting, ceiling grid, or acoustical material, they must be submitted and written approval obtained 14 days prior to bid date. The test data submitted must be for a compatibly tested system including all components. The test must be conducted at appropriate independent testing laboratories.

2. SUSPENSION

2.1 The suspension system shall be Armstrong Pentaflex Suspension System. Both main and cross members shall have an electogalvanized finish. The main runner shall have a 1½" web and shall be 28-gauge steel.

2.2 Wall molding shall accept the suspension system.

2.3 Suspension system shall be supported by 12-gauge hanger wires on nominally 5-ft centers.

2.4 All members shall conform to ASTM C-635-69 for dimensional tolerances and straightness.

2.5 Main runners and cross members shall provide support for lighting fixtures

3. NOISE CONTROL

3.1 The acoustical panels shall be Aleria design and shall have a noise-reduction coefficient (NRC) in the range of .55–.55 according to ASTM C-423 as substantiated by independent laboratory test.

3.2 The ceiling sound transmission class (STC) shall fall within the range 40–44.

4. LIGHTING

4.1 Luminaires shall be Westinghouse 1' x 4' Pentaflex units.

4.2 Luminaires shall be supported on main runners with integral support mechanism.

4.3 Luminaires shall be of formed and rigidized 22-gauge cold-rolled steel, finished with white baked acrylic enamel with light reflectance of at least 86% as substantiated by independent laboratory test.

4.4 Luminaires shall have parallel mounted lights with light output with TOPA as follows and with photometric data substantiated by independent laboratory test submitted two weeks prior to bid date.

4.5 Ballast shall be ETL certified to Certified Ballast Manufacturers' standards, high power factor, rapid start, UL labeled, Class P, sound rated A, (120) (277) volts.

4.6 Lenses shall be framed and shall hinge from either side. Lenses shall be acrylic with a yellowness increase of not more than 3 IES-NEMA-SPI units after 1000 hours' exposure in an Atlas FDA-R Fade-Ometer according to ASTM E42.

4.7 Lighting layouts shall provide the specified illumination levels according to coefficients of utilization substantiated by independent laboratory test.

5. FIRE PROTECTION

5.1 Acoustical panels shall have Flame-Spread Rating of Class 25 according to Federal Specification SS-S-118A, as substantiated by independent laboratory test.

6. INSTALLATION

6.1 Suspension System—The Armstrong Ceiling Systems Contractor shall furnish and install the Armstrong Pentaflex Luminaire Grid Suspension System. The system shall be installed in accordance with the drawings in strict accord with the manufacturer's recommendation. The suspension system shall be supported by 12-gauge wires. Main runners shall be suspended 4' and 1' OC and be supported every 5 lineal feet. Five-foot stabilizer bars shall be installed every 5 lineal feet perpendicular to the main runner. T splines or access angles shall be inserted into the kerfs of the panels perpendicular to the main runners.

6.2 Acoustical Panels—The Armstrong Ceiling Systems Contractor will install the Armstrong Pentaflex Luminaire Panels as specified above or in the drawings. The panels shall be installed in strict accord with manufacturer's recommendations.

6.3 Installation of acoustical materials shall not be made when the building is excessively cold and damp, or hot and dry. Temperature and humidity conditions closely approximating the interior conditions which will exist when the building is occupied should be maintained before, during, and after installation.

Quadraflex Luminaire Ceiling System

Armstrong

Armstrong Quadraflex Luminaire is an engineered ceiling system designed to incorporate a high-intensity-discharge light source. It will accommodate mercury-vapor lamps up to 400 watts and will take maximum advantage of their desirable illuminating properties.

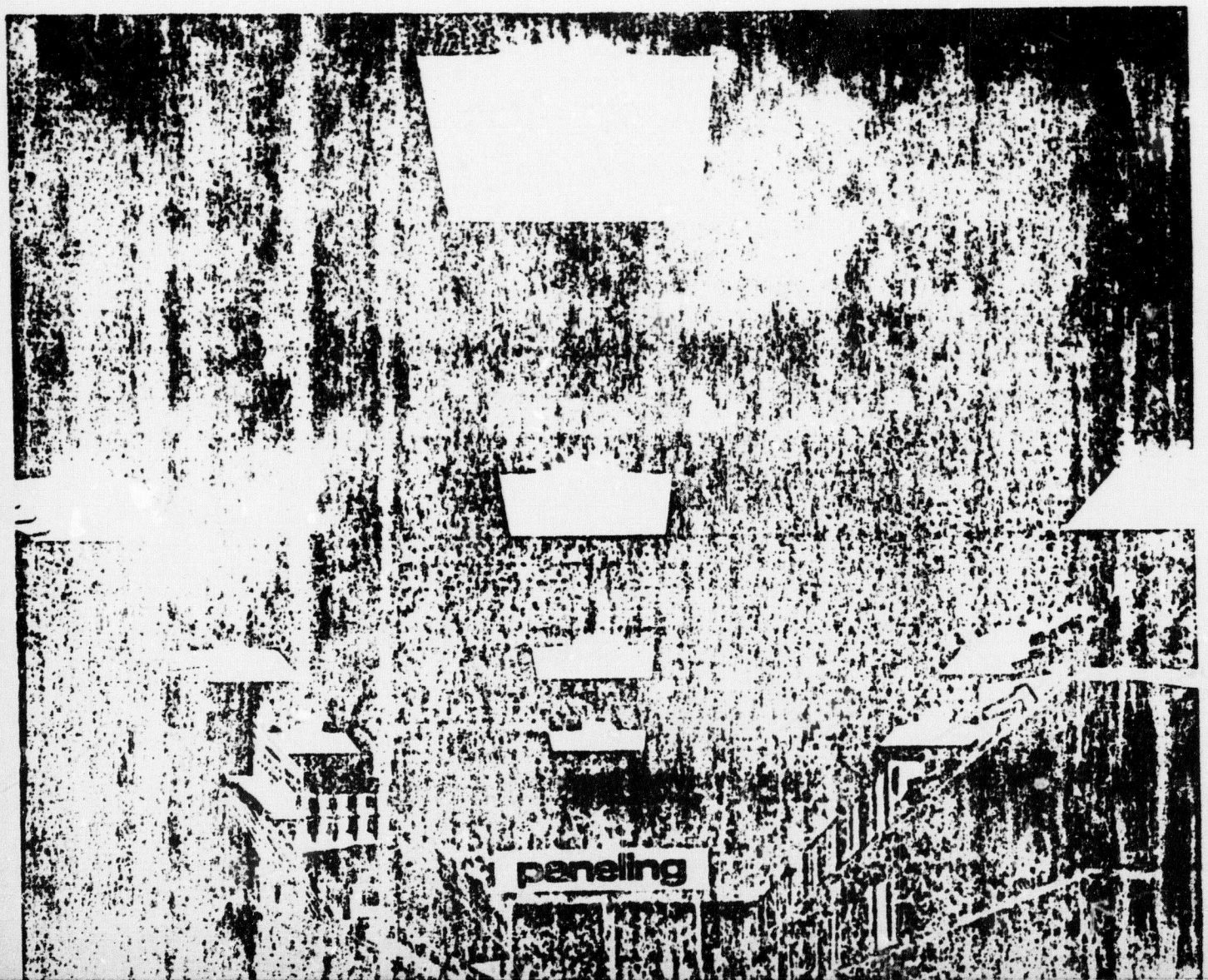
Quadraflex combines a standard lay-in suspended ceiling with an efficient vaulted module which houses the light fixture, high-intensity-discharge lamp and a specially designed clear prismatic lens. The point-source type of lighting provided by mercury-vapor lamps is gaining rapid acceptance in retail shops, supermarkets and department stores. The light-distribution pattern is mainly downward, thus better illuminating merchandise, particularly on the lower shelves.

Compared with fluorescent strip lighting or 2' x 4' recessed troffers, Quadraflex gives the ceiling a clean, uncluttered look, more spacious and open. The vaulted module and acrylic refractor lens provide shielding and light control to minimize glare.

At the same time, the point-source downlighting is retained to accent the merchandise and give it added sparkle and texture.

Color rendition provided by mercury-vapor lamps has advanced to the point that it equals or exceeds other types of lighting. A variety of color effects can be achieved by selection from several lamp types.

The Quadraflex Luminaire System, with lamps such as Westinghouse Beauty-Lite, will provide more light per watt than cool white deluxe or warm white deluxe fluorescent tubes. This superior lighting performance is a result of mercury-vapor's inherent high system efficiency and the favorable light-distribution pattern of the Quadraflex lighting module.



product data

With Quadraflex, four-foot-square modules typically are spaced twelve feet on centers. This system requires only a fraction of the fixtures of conventional fluorescent systems and uses proportionally fewer ballasts and lamps.

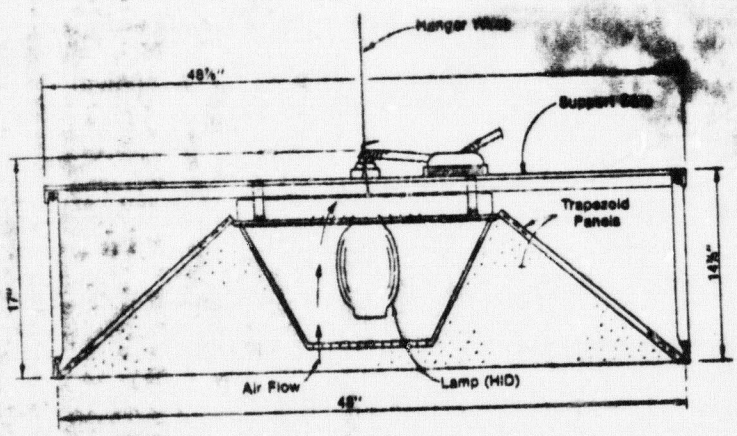
Mercury-vapor lamps last longer than most fluorescent tubes or incandescent lamps; and there are fewer in the ceiling, so replacement labor costs are significantly lower.

Most of the heat from mercury-vapor lamps goes into the plenum and can be exhausted to the outside during much of the year, thus reducing operating costs. When required, heat can be returned to the store area.

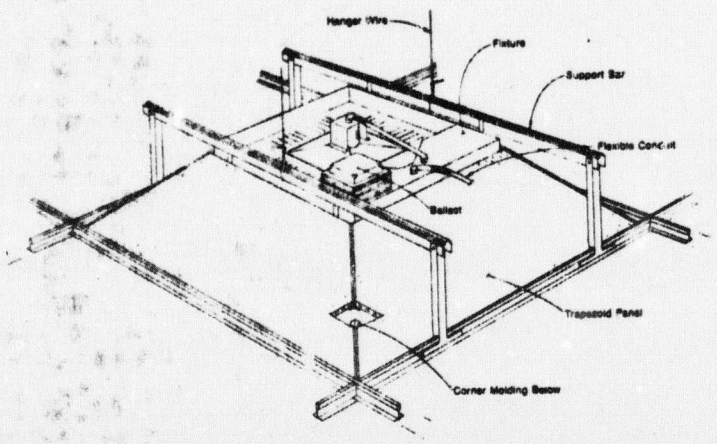
The Quadraflex module is interchangeable with any flat 4′ x 4′ module anywhere in a standard ceiling, so lighting can be rearranged when required.

The lighting module can be installed in any existing ceiling, provided there is 17½″ of headroom above the ceiling plane.

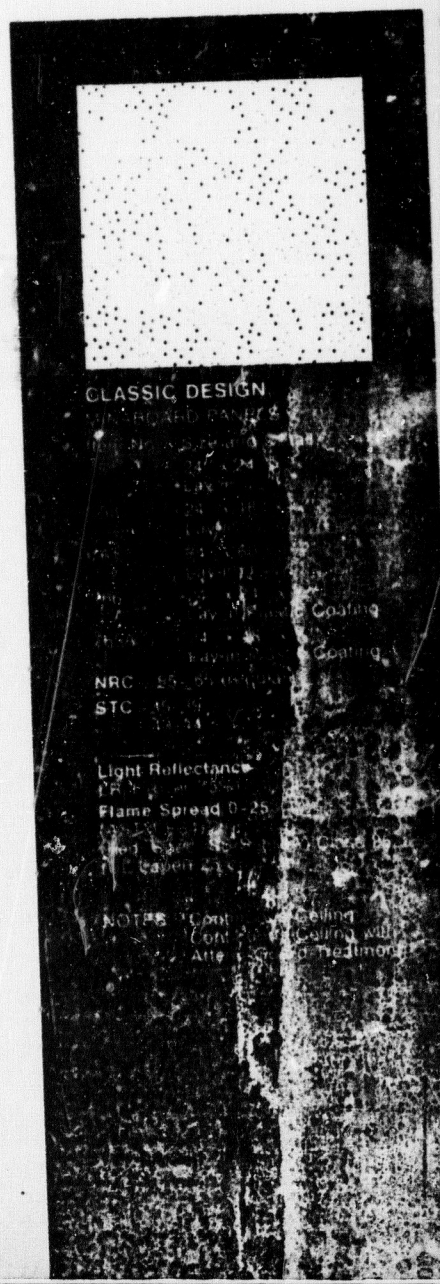
The Quadraflex System also will accommodate 175- and 250-watt mercury-vapor lamps as well as other HID sources, including 175- and 400-watt metal halide and 100- and 150-watt high-pressure sodium. Fixture standby lighting also can be incorporated in the Quadraflex module.



Quadraflex Elevation



Quadraflex Assembly



Luminaire
Ceiling Systems
Quadraflex

guide specification

1. SCOPE

1.1 The ceiling shall be Armstrong Quadraflex Luminaire Ceiling System. The system basically shall be 2′ x 4′ exposed grid ceiling with 4′ x 4′ x 17″-high coffered (vaulted) lighting modules as required.

1.2 The ceiling system shall integrate sound absorption, lighting, and air-return capabilities.

1.3 The lighting modules and acoustical modules shall be interchangeable one with another on a 4′ x 4′ modular basis.

1.4 The ceiling system shall provide concealment for all services in the plenum and ready access thereto without impairment of any function.

2. SUSPENSION SYSTEM

2.1 The suspension system shall be a commercial exposed grid consisting of 1½″-high T-bar with square bulb section (except the Slide Lock type).

2.2 Wall molding shall match and detachably support the framing.

2.3 Framing shall comply with ASTM C635 Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

3. NOISE CONTROL

3.1 Acoustical panels shall be mineral fiberboard (Type III Federal Specification SS-S-118A) with Classic design (Georgian optional).

3.2 The acoustical panels shall have noise-reduction coefficient (NRC) in the range of .55–.65 (Georgian—.50–.60) according to ASTM C423 Sound Absorption of Acoustical Materials in Reverberation Rooms, as substantiated by independent laboratory test.

4. LIGHTING

4.1 Lighting shall be integral with the ceiling system and shall be by the Quadraflex coffered lighting module.

4.2 The luminaire shall comprise the lighting fixture, lens, and the coffered acoustical panels. Flat (noncoffered) acoustical panels shall match the coffered panels.

4.3 Acoustical panels shall have a washable matte white finish with light reflectance of LR-1 (.75 or greater) according to Federal Specification SS-S-118A.

4.4 Lighting fixtures shall be nominally 20½″ x 20½″ x 5″ high.

4.5 Lighting fixtures shall be .030″ (22-gauge) steel finished on the exposed surfaces with white enamel with light reflectance of at least 85%, as substantiated by independent laboratory test.

4.6 Lighting fixtures shall be supported in the coffer on trusses integral with the main framing members.

4.7 Lighting fixtures shall comply with UL57 Standard for Electric Lighting Fixtures.

4.8 The luminaire shall be direct type and shall comprise one 400-watt mercury-vapor lamp.

4.9 Luminaires shall provide 84% light output as substantiated by independent laboratory test.

4.10 The lens shall be demountably supported on hangers providing ready access to lamp and ballast.

4.11 The lens shall be clear acrylic plastic with a yellowness increase of not more than 3 IES-NEMA-SPI units after 1,000 hours' exposure in an Atlas FDA-R Fade-Ometer, according to ASTM D1499 (Type E, Cortex D filters) and measured according to ASTM D1925.

4.12 Lighting layouts shall provide specified illumination according to utilization coefficients for the lighting system as substantiated by independent laboratory test.

4.13 Dead load of the lighted module shall be nominally 49 lb; of 2′ x 4′ flat modules, nominally 9.5 lb.

5. HVAC

5.1 Air-return capability shall be integral with the ceiling system and shall be by the Quadraflex lighting module.

6. FIRE PROTECTION

6.1 Lenses shall comprise clear acrylic plastic having the following characteristics:

6.1.1 Burning rate of 2½″ per minute according to ASTM D635 Flammability of Self-Supporting Plastics.

6.1.2 Smoke Density of 75 according to ASTM D2843 Measuring the Density of Smoke from the Burning or Decomposition of Plastics.

6.2 Acoustical panels shall have Flame-Spread Rating of 25 (Class 25 according to Federal Specification SS-S-118A).

7. INSTALLATION

7.1 Suspension system shall be installed according to ASTM C636 Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

7.2 Suspension system shall be supported by 12-gauge hanger wires nominally 4′ on centers on main runners.

7.3 Hangers shall be (cast-in-place hanger wires) (percussion hanger inserts) (other).

7.4 Luminaires shall be installed in the framing according to reflected ceiling plans and wired to junction boxes according to National Electrical Code.

7.5 Luminaires shall be supported by a 12-gauge hanger wire at each midpoint of each fixture support bar.

7.6 Acoustical panels shall be installed according to Armstrong installation recommendations.

Luminaire VGM



Armstrong Luminaire VGM is a vaulted lighting module that gives a dramatic dimensional flair to a standard lay-in ceiling system. With VGM, light is evenly distributed, without shadow or glare, to the working area below.

Ballast—VGM Ballast is designed for a 120-volt (277-volt optional) operation. It carries a sound rating of A, a high power factor, a UL Class P label, and is ETL certified as meeting CBM standards.

Lamps—Factory-assembled with provision for four 40-watt rapid-start fluorescent lamps.

UL Listed—Carries UL label, "Suitable for Use With Suspended Ceilings."

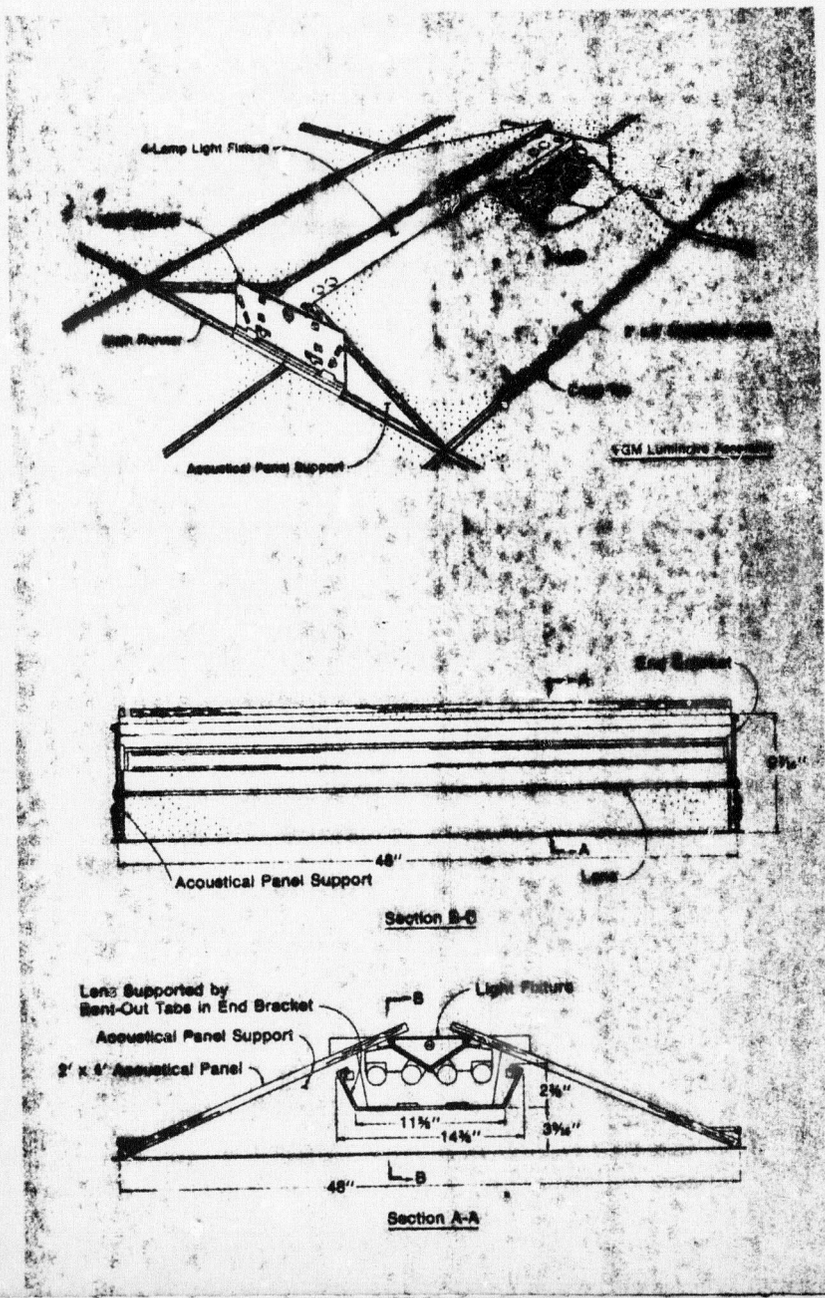
Construction—Lightweight steel for durability and easy handling. Consists of one fixture with contoured ballast cover, two end brackets for mounting, and two acoustical panel supports.

Continuous Rows—Fixtures may be run in a continuous row. UL approved as a wireway for same branch circuit, wiring may be accomplished by using knockouts in end brackets.

Size—Length 48"; Width 48"; Height 10".

Acoustical Side Panels—Any of the Armstrong Minaboard Lay-in panels may be used for the acoustical side panels of the vaulted lighting module. See Lay-in Ceilings Section for complete data.





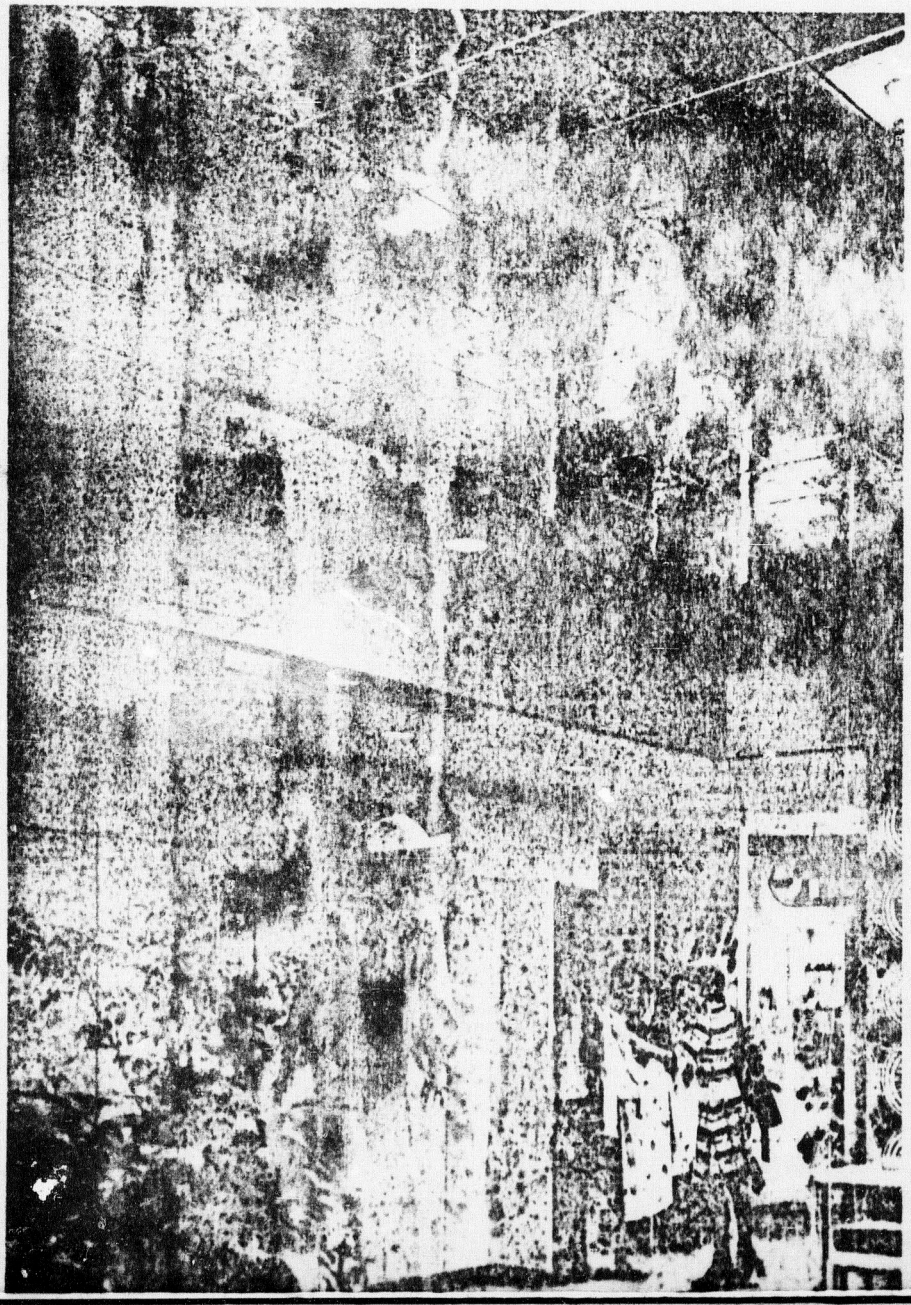
Designer Series

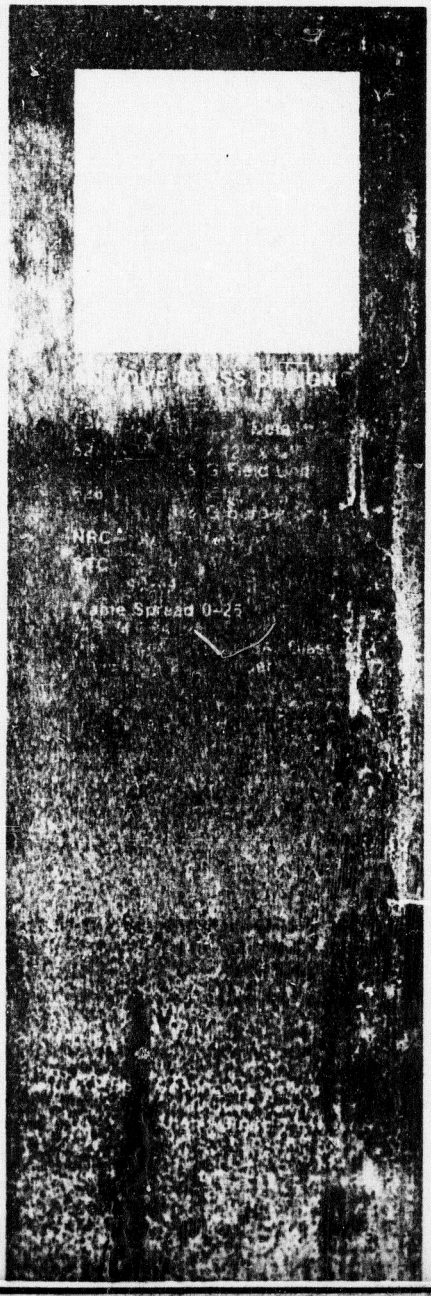
Antique Glass

Armstrong

Armstrong Antique Glass Ceilings combine the unique visual effect of a mirrored surface with the very practical benefits of acoustical properties and fire resistance. The reflective surface is a polyester film on a tongue-and-groove mineral-fiber tile which can be installed in a standard concealed suspension system. In addition to sparkle and excitement, Antique Glass adds a new geometry to any room.

UL Time-Design-Rated
Fire-resistive Antique Glass Ceilings can be used in place of ⅝" Fire Guard Tile in all applicable designs.





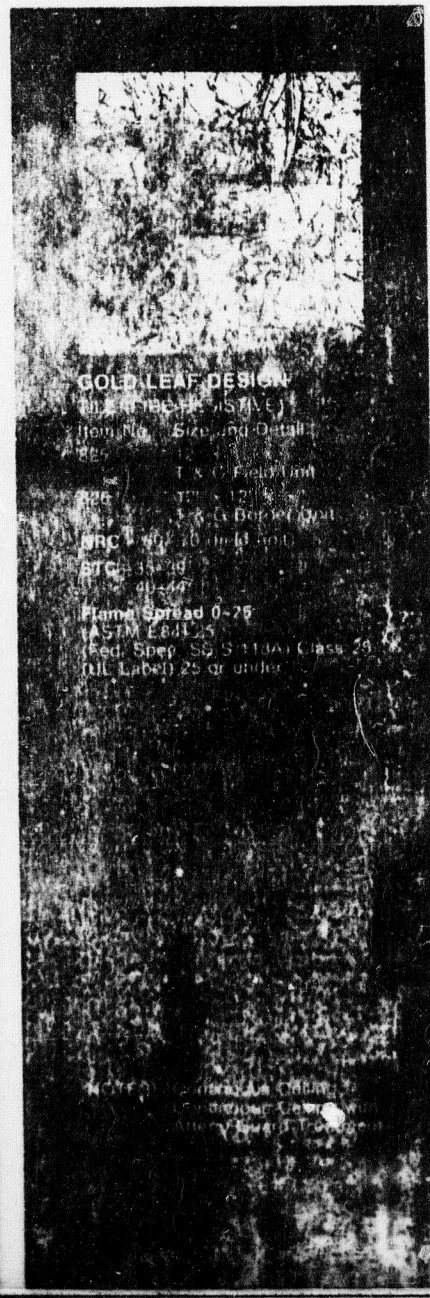
Designer Series

Gold Leaf

Gold Leaf Ceilings offer the elegance of a handcrafted look with the practicality of sound absorption and fire resistance. The handsome surface is a polyester film on a tongue-and-groove mineral-fiber tile which can be installed in a standard concealed suspension system.

UL Time-Design-Rated
Fire-resistive Gold Leaf Ceilings can be used in place of ⅝" Fire Guard Tile in all applicable designs.





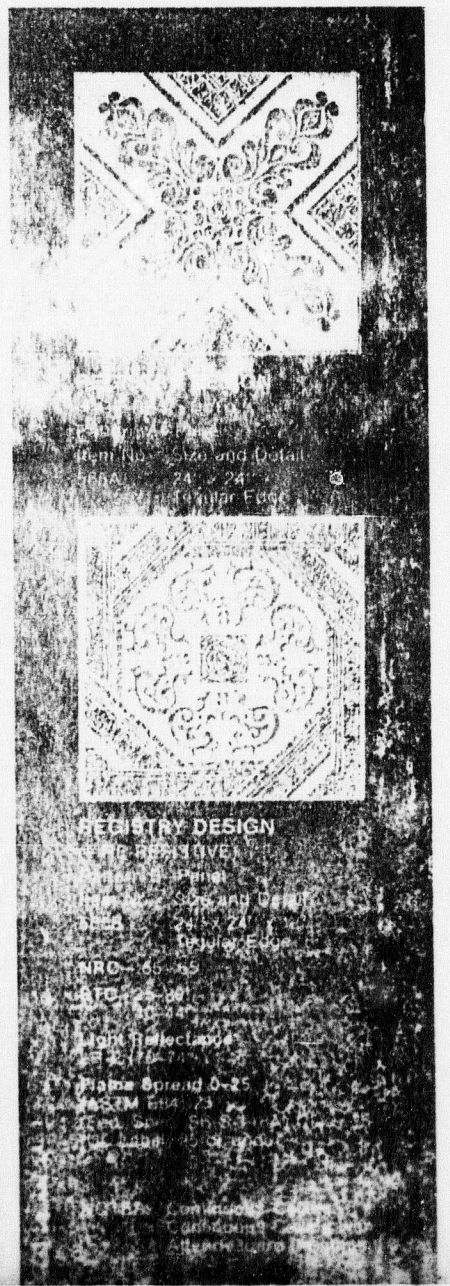
Designer Series

Registry

Armstrong Registry is a two-design lay-in panel board system that offers exciting decorative impact at heights of 14 and even 16 feet. Large-scale Designs A and B are installed with a special low-gloss grid to form a beautifully coordinated allover effect. The cutback Tegular edges of the 24"-square panels drop the design surface flush with the grid. Registry combines traditional styling with contemporary technical requirements.

UL Time-Design-Rated
Fire-resistive Registry Ceilings can be used in place of ¾" Fire Guard Tile in all applicable designs.



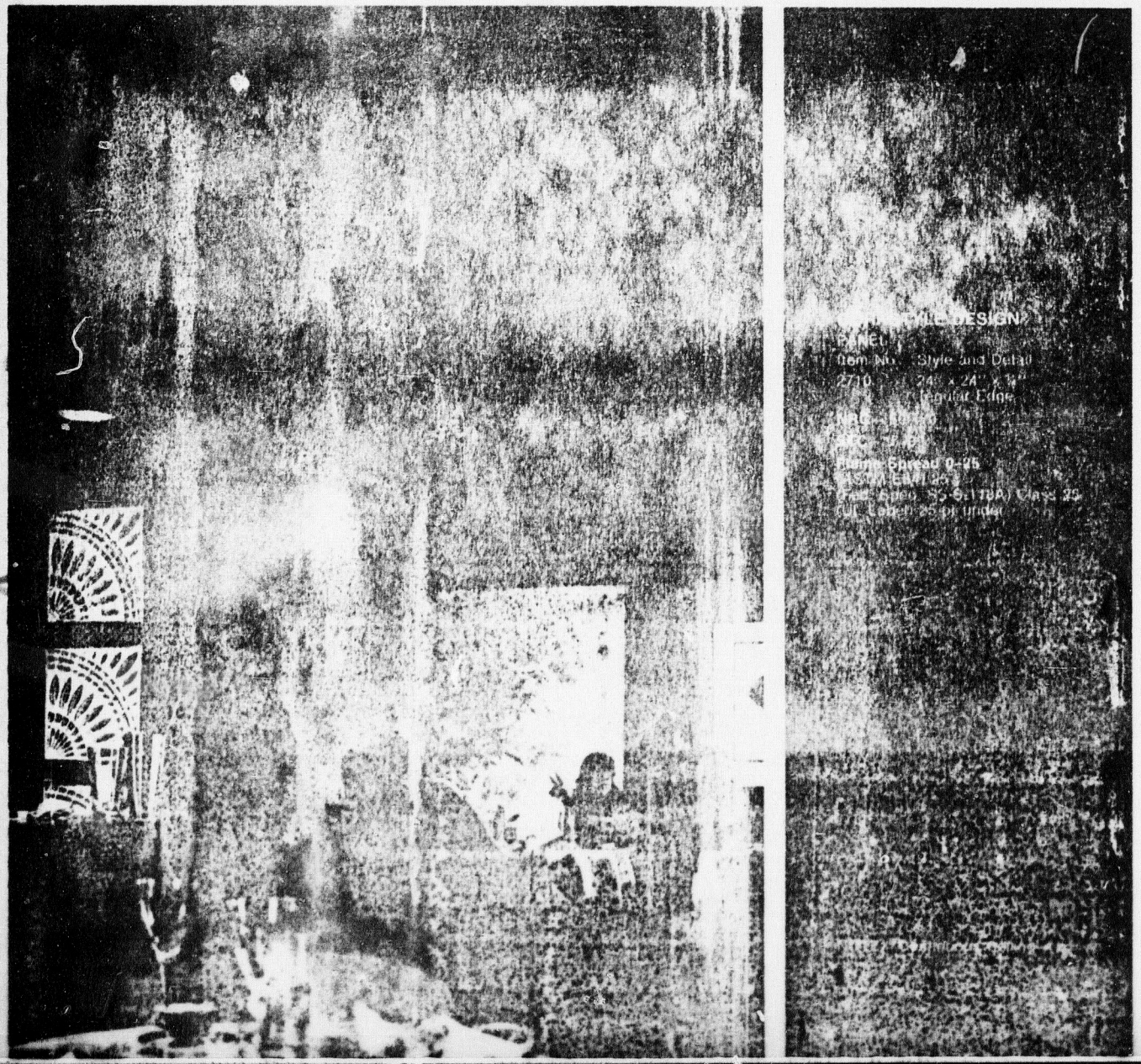


Designer Series

Corkstyle

Corkstyle's boldly textured surface and natural shading present a noncombustible acoustical surface that is natural and visually appealing. Excellent for mood-setting atmospheres, is easily installed in exposed-grid systems, with black grid being recommended.

91 a



Lay-in
Ceilings

Second Look*

Armstrong

Armstrong Second Look is an exciting new concept in an acoustical lay-in ceiling system. The 24" x 48" Second Look panels are easy to install and afford the cost efficiency of an exposed-grid system. A unique design, matching the scored marks on the ceiling board and the grid finish, disguises the grid and creates an overall appearance of tile.

UL Time-Design-Rated—Fire-resistive Second Look I, ¾" thickness, can be used in place of ⅝" Fire Guard Lay-in panels in all applicable designs.

Insulation Value—Average C factor (at 75 F) is .65 at ⅝" thickness.

Surface Design—
Second Look I: A Cortega design, painted white, with 1"-wide scored marks to simulate 12" x 12" tile.

Second Look II: A Cortega design, painted white, with a 1"-wide scored mark to create 24" x 24" Tegular lay-in panel appearance.

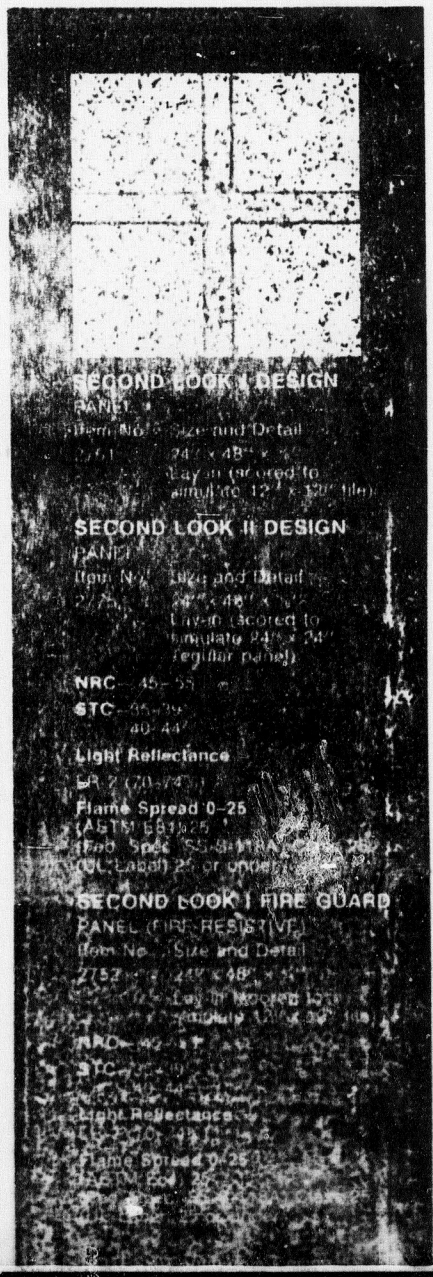
Surface Finish—Factory-applied, white vinyl latex paint finish.

Grid Finish—Special color-coordinated grid to match the finish on the Second Look panels.

Installation—Lay-in units rest on the exposed flanges of exposed-grid suspension system installed in a 2' x 4' pattern.

*Second Look Ceiling Systems I and II patent pending





Lay-in
Ceilings

Boldface

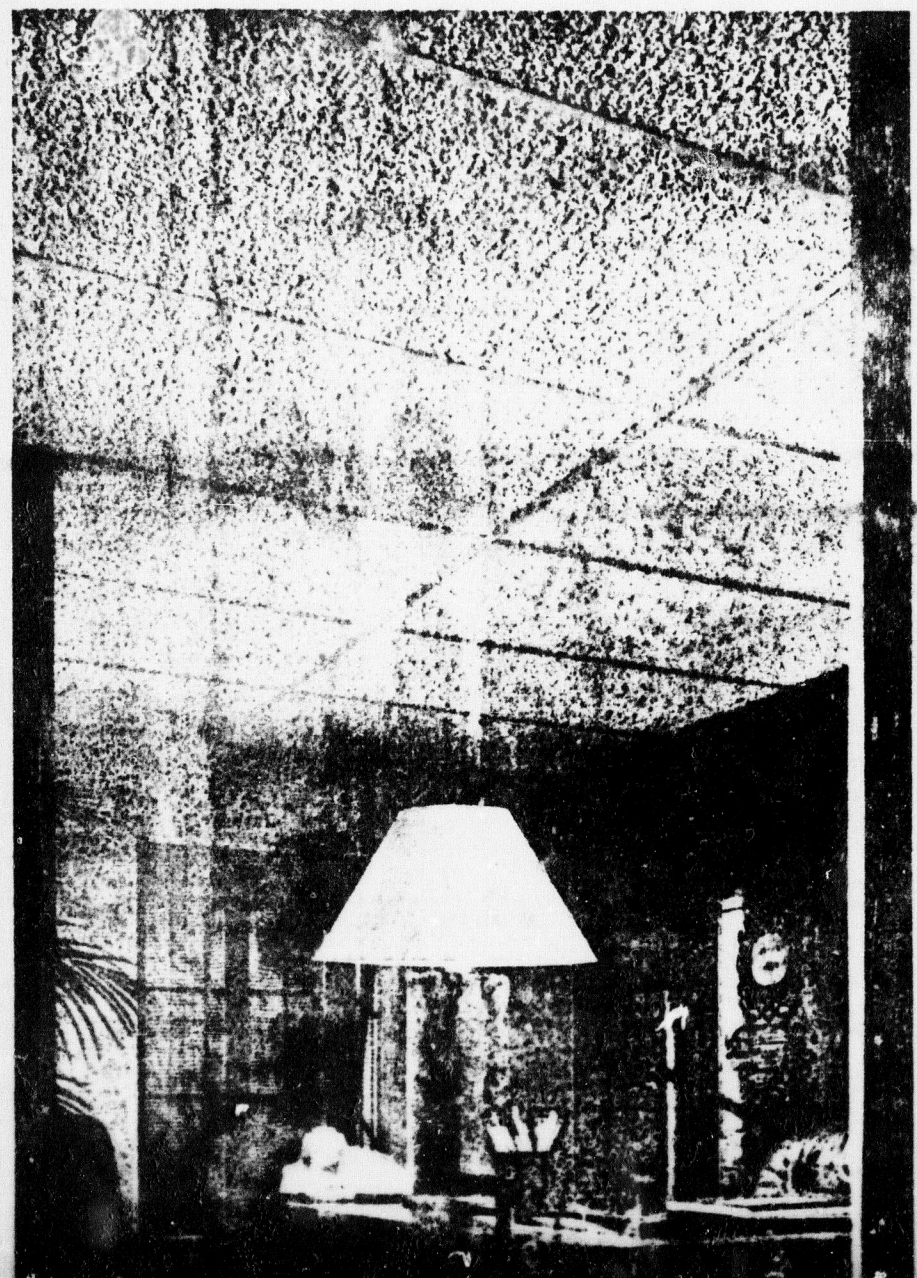
Armstrong Boldface is an architecturally designed rough-textured acoustical lay-in panel for exposed-grid ceilings. This heavy texture allows for an economical and easy-to-install ceiling system. Boldface is available in 24" x 24" and 24" x 48" lay-in panels and 24" x 48" Tegular lay-in panels.

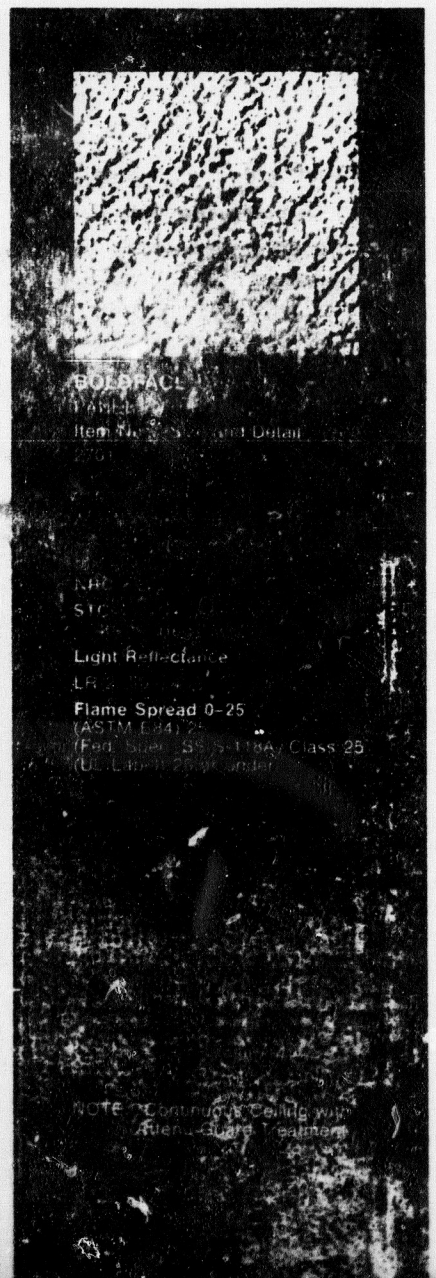
Insulation Value—Average C factor (at 75 F) is .50 at ¾".

Surface Design—Rough natural texture.

Surface Finish—Factory-applied, white paint finish.

Installation—Lay-in units rest on the exposed flanges of exposed-grid suspension system.





Lay-in
Ceilings

Armatuff*

Armstrong

Armstrong Armatuff is a durable-surfaced acoustical lay-in panel for exposed-grid ceilings. Armatuff is the ideal product for use where the ceiling might possibly be subjected to abuse. Because of a unique overlay of a tough mineral material, Armatuff will withstand all types of repeated blows. In addition, the attractive rough-textured surface design hides most slightly damaged areas that might occur under normal use.

UL Time-Design-Rated—Fire-resistive Armatuff panels may be substituted for like size and thickness of square-edged Fire Guard Lay-in panels in all applicable designs.

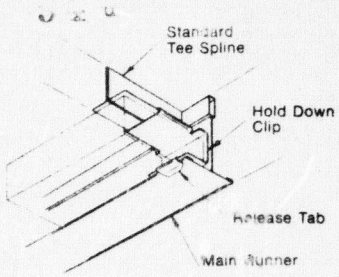
Insulation Value—Average C factor (at 75 F) is .65 at ⅝" thickness.

Surface Design—Nondirectional, rough natural texture with acoustical holes.

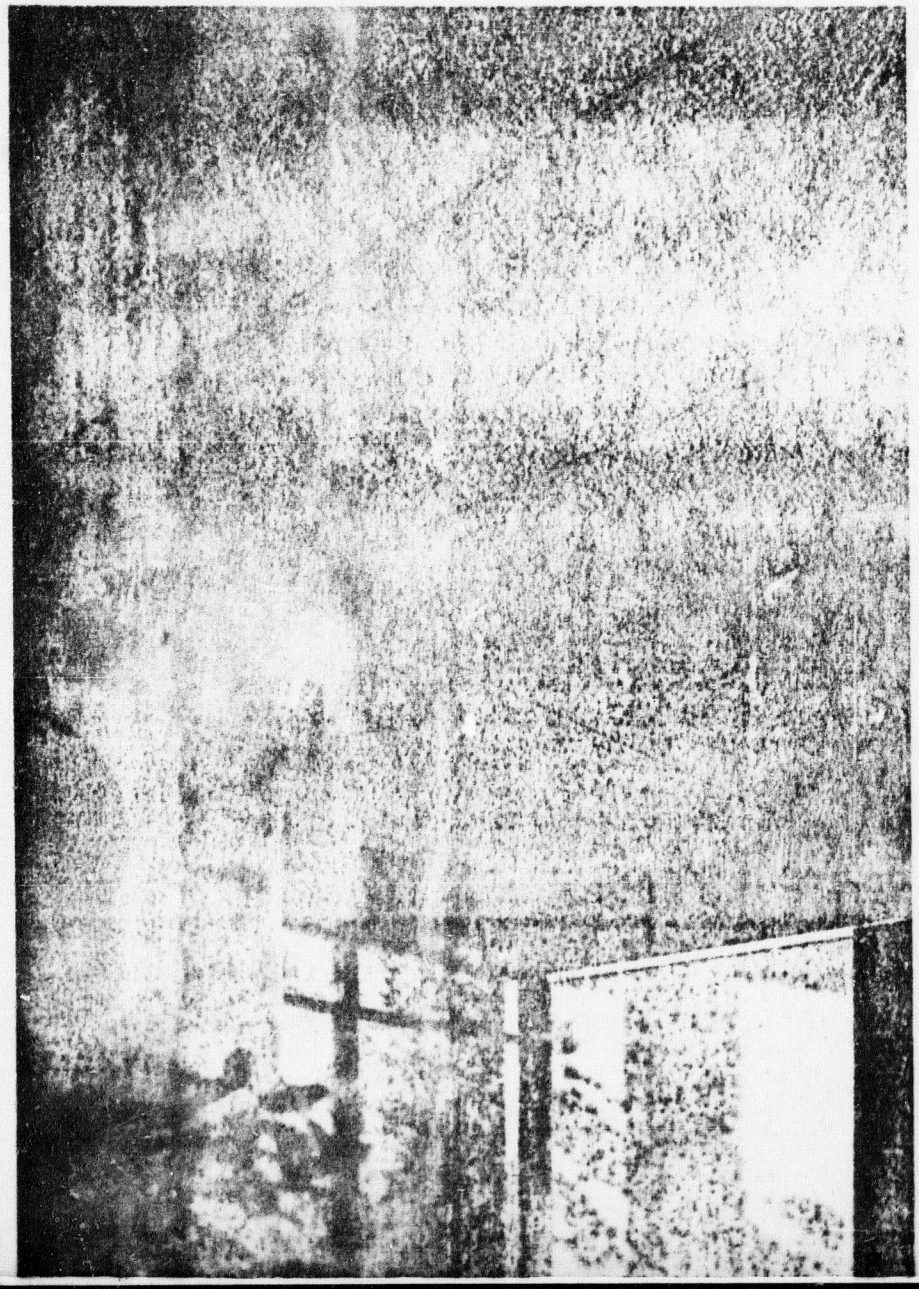
Surface Finish—Factory-applied, white vinyl latex paint finish.

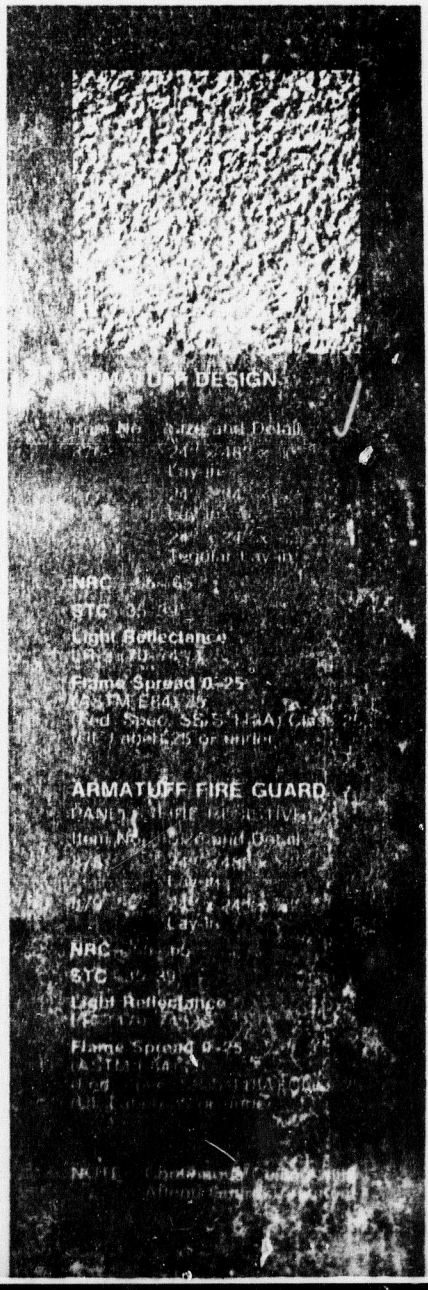
Installation—Lay-in units rest on the exposed flanges of exposed-grid suspension system.

Impact Clip System—Where exceptional abuse will be anticipated, the Armstrong Impact Clip System (Item 880) should be specified. This system prevents the ceiling board from moving when subjected to most types of blows.



* Process patents pending.





Lay-in
Ceilings

Armashield

(polymeric-faced
mineral fiber)

Armashield Ceiling panels are designed for areas where exceptional resistance to damage and staining is required. A mineral fiberboard faced with a tough polymeric finish, this ceiling material is UL test rated 25 and has a high degree of washability. Surface pattern is the popular perforated Classic Design.

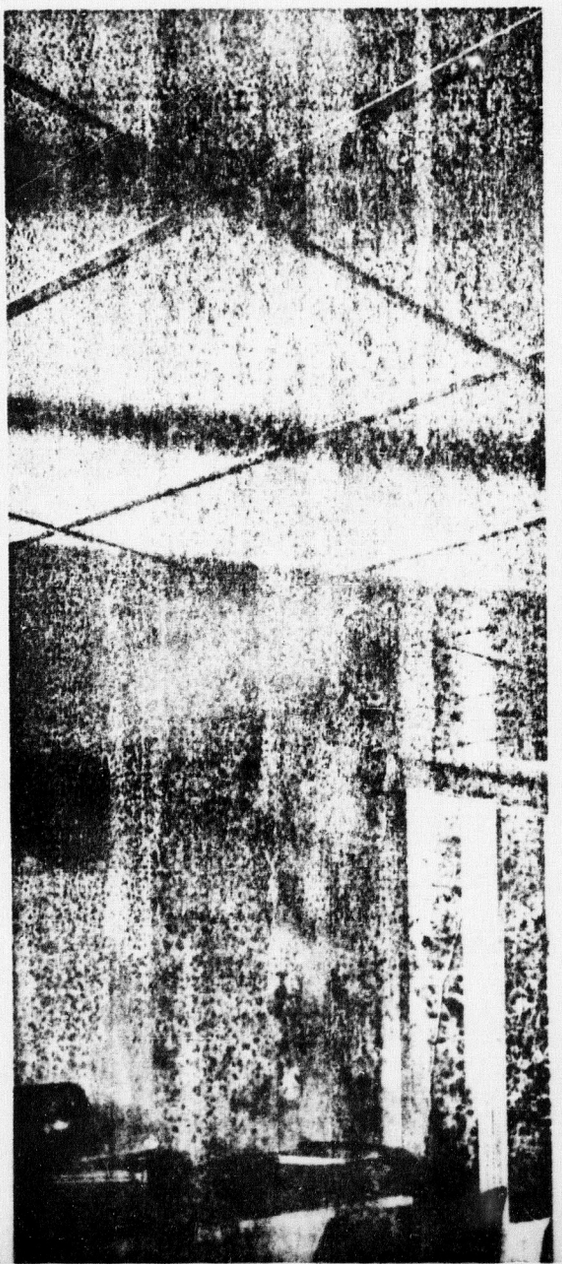
UL Time-Design-Rated
Fire-resistive Armashield panels may be substituted for like size and thickness of Fire Guard Lay-in panels in all applicable designs.

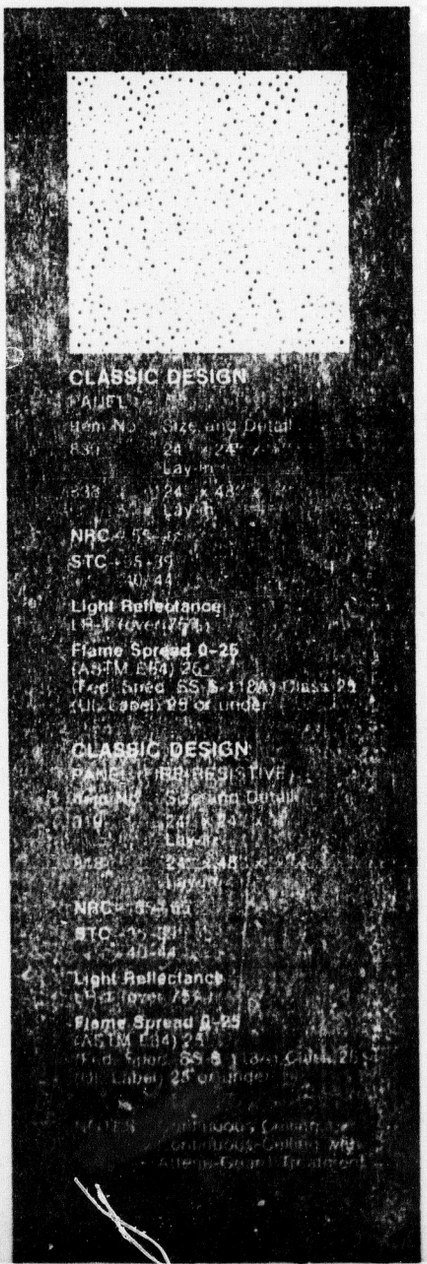
Damage Resistance—
The polymeric finish is a protective, 10-mil film of polyvinyl chloride. It will withstand, without fracturing, much of the surface-impact damage common to ceilings in high-abuse areas such as school corridors, restaurants, and factories. In the event damage does occur (a board is dropped, for example, and a corner fractures), the flexible vinyl film is strong enough that often the board can be bent back to shape and replaced in the metal grid system with little apparent damage.

Stain Resistance—
Most stains can be simply wiped off the Armashield surface with a dry cloth. Stubborn blemishes will normally respond to an ordinary household cleanser or a scrub brush, without harming the surface coat.

Armashield Ceilings

guide specification





1. MATERIALS

1.1 Acoustical ceiling material shall be Armstrong Armashield panels: Item Number ( ); Design Size (2′ x 4′); Thickness (⅝″). The lay-in units shall have a Flame-Spread Rating of Class 25 according to ASTM E84 as substantiated by independent laboratory test. The lay-in units shall have a factory-applied, white vinyl coating with a light reflectance of over 75%.

1.2 Suspended ceiling system shall be exposed-grid system with components formed from commercial-quality cold-rolled steel, zinc-coated and pre-painted. Exposed finish shall be low-sheen satin white or (etched and anodized aluminum). The suspension system shall support the ceiling assembly shown on the drawings or specified with a maximum deflection of 1/360 of the span.

2. DAMAGE RESISTANCE

The ceiling material shall withstand the impact of a 250-gram weight having a 1″-diameter round tip dropped from a height of 36″ (20 in.-lb) with the sample placed on a 12″ x 12″ frame of sufficient depth to allow deflection of the sample without contacting the surface on which the frame rests. The surface of the impacted sample shall show no cracking and shall have a maximum indentation of 0.050″ as measured from the surface of the sample.

Ceramaguard Ceilings

Armstrong

Armstrong Ceramaguard is a unique, high-density, ceramic ceiling material in lay-in panel form. It is extremely resistant to heat, moisture, and many corrosive chemical fumes.

Unaffected by Moisture

It retains its physical integrity in high-humidity conditions, even when saturated with water.

This resistance to moisture damage allows installation of Ceramaguard before the structure is completely dry. It also qualifies this ceiling material for many severe service applications. Ceramaguard performs well as an all-weather ceiling for soffits, canopies, and similar exterior applications. Its moisture- and corrosion-resistant properties make it an excellent choice for indoor swimming pools, food- and beverage-processing areas, textile mills, and many other "wet" service conditions.

Resistant to Steam

In laboratory tests, Ceramaguard has been subjected repeatedly to steam temperatures up to 275 F with no damage.

Resistant to Chemicals

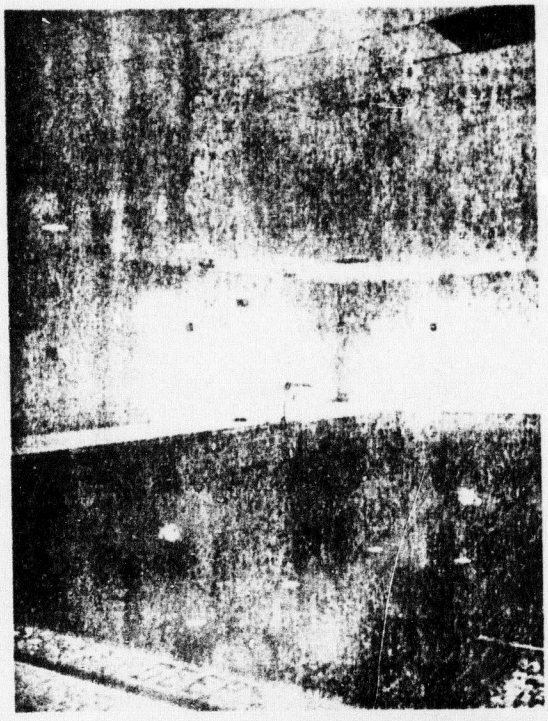
Test results recommend application of Ceramaguard ceilings in plants processing food and drugs, minerals and metals, paints and inks, plastics and rubber, pulp and paper, and many other products. For recommendations on specific corrosive applications, consult your Armstrong representative.

Ceramaguard finish will withstand 5,000 scrub cycles when tested according to AIMA IB Specification No. 7, May 1971.

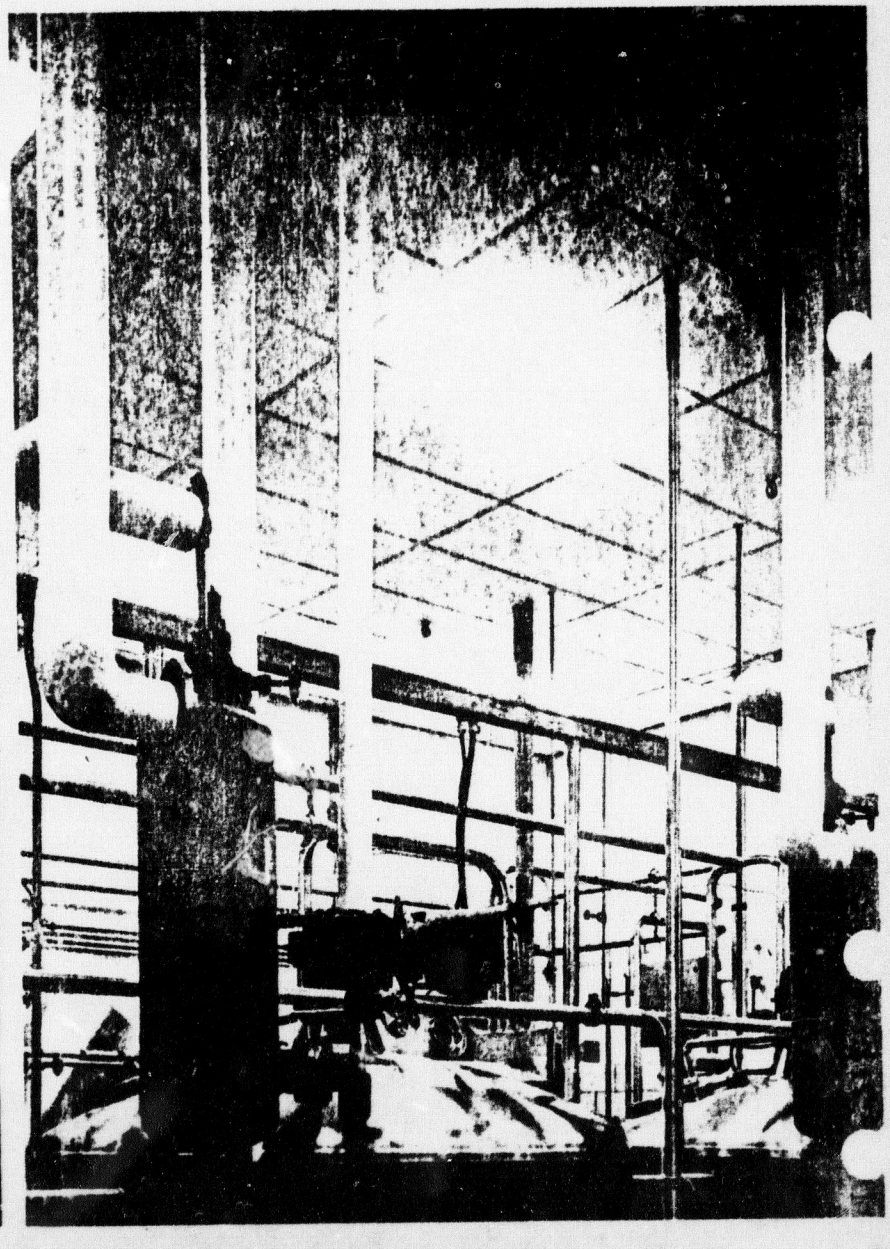
UL Time-Design-Rated

Armstrong Ceramaguard provides fire-resistance ratings up to 3 hours for floor/ceiling construction assemblies and up to 2 hours for roof/ceiling assemblies.

The data beginning on page 56 include a summary of Underwriters' Laboratories, Inc., ratings achieved by Ceramaguard Lay-in panels for a variety of constructions.

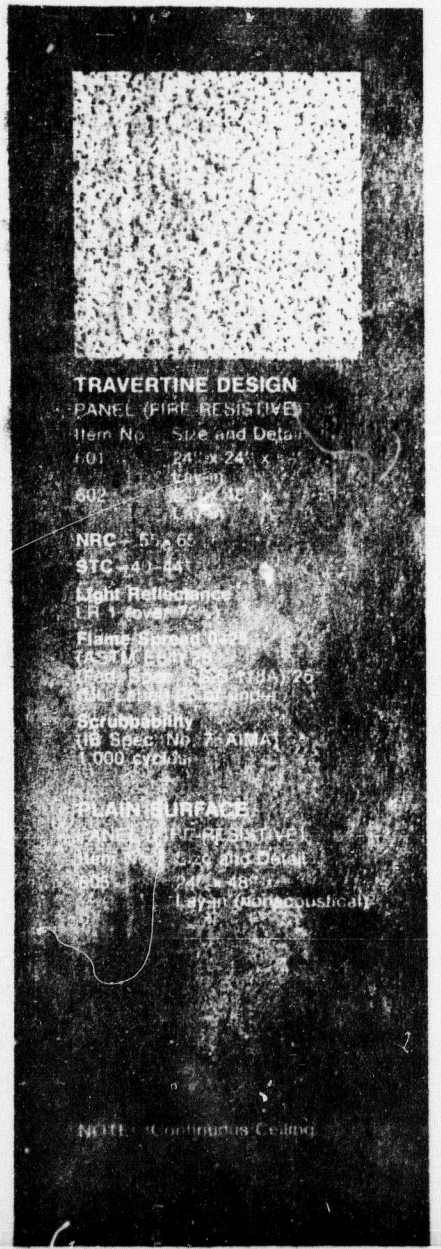






product data

guide specification



1. ACOUSTICAL MATERIALS

1.1 Acoustical materials shall be Armstrong Cork Company Ceramaguard:
(Travertine Design)
(Plain Surface)

1.1.1 Acoustical materials shall be panel size ( ); thickness ( ); edge detail ( ).

1.1.2 Acoustical materials shall have washable matte white finish with light reflectance of LR-1 according to Federal Specification SS-S-118A.

2. SUSPENSION

2.1 Suspension system shall be ( ) gauge galvanized steel and shall be finished on exposed surfaces with (off-white enamel) (other).

2.2 Matching wall molding shall detachably support framing.

2.3 Framing shall comply with ASTM C635 Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings. Suspension system shall be classified (light) (intermediate) (heavy) duty. (Framing shall be suitable for severe environmental conditions of high humidity and salt spray.) For all corrosive environments, extruded aluminum framing with corrosion-resistant finish such as 202 R1 anodized finish or Cupolite as supplied by Cupples Products Division of H. H. Robertson Co., or a hot-dipped galvanized concealed framing is recommended.

3. NOISE CONTROL

3.1 Acoustical materials shall have noise reduction coefficient (NRC) in the range .55–.65 according to ASTM C423 Sound Absorption of Acoustical Materials in Reverberation Rooms.

3.2 Ceiling sound-transmission class (STC) shall be in the range 40–44 according to Acoustical Materials Association (AMA)1-II Ceiling Sound-Transmission Test by Two-Room Method.

4. FIRE PROTECTION

4.1 Acoustical materials shall have Class 25 Flame-Spread Rating according to Federal Specification SS-S-118A.

4.2 Fire-rated installations shall conform to the applicable fire-rated assembly design(s).

5. INSTALLATION

5.1 Install suspension system according to ASTM C636 Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

5.2 Support suspension system by 12-gauge hanger wires. Hangers shall be (cast-in-place hanger wires) (percussion hanger inserts) (other).

5.3 For fire-rated installations, install suspension system according to applicable fire-rated assembly design(s).

5.4 For exterior soffits, canopies, etc., installation shall comply with these additional requirements:

5.4.1 Provide heavy-duty suspension system, suitable for severe environmental conditions of high humidity, according to ASTM C635.

5.4.2 Install grid on 2-foot centers.

5.4.3 Support framing directly from structure above by means of standard hanger rod or by hanger wire rigidized by suitable lengths of channel or angle iron attached thereto.

5.4.4 Reinforce panels on the back by lengths of channel 1½" x nominal panel length. Secure channels to panels by hanger wire strung through the center holes of the cross tees. Draw wire tight to prevent upward movement of the panels.

5.4.5 Provide access panels as indicated on plans. These shall comprise standard panels framed with steel C channel or the like and installed in framing by sheet metal screws.

Lay-in Ceilings

Minaboard, Minatone (Tegular), **Acoustical** Fire Guard

These materials are made in acoustical lay-in panels for exposed-grid suspended ceilings. They are made with efficient, fire-resistive mineral wool and provide economical, easy-to-install ceilings. Armstrong Minaboard panels are available in various sizes and surface designs.

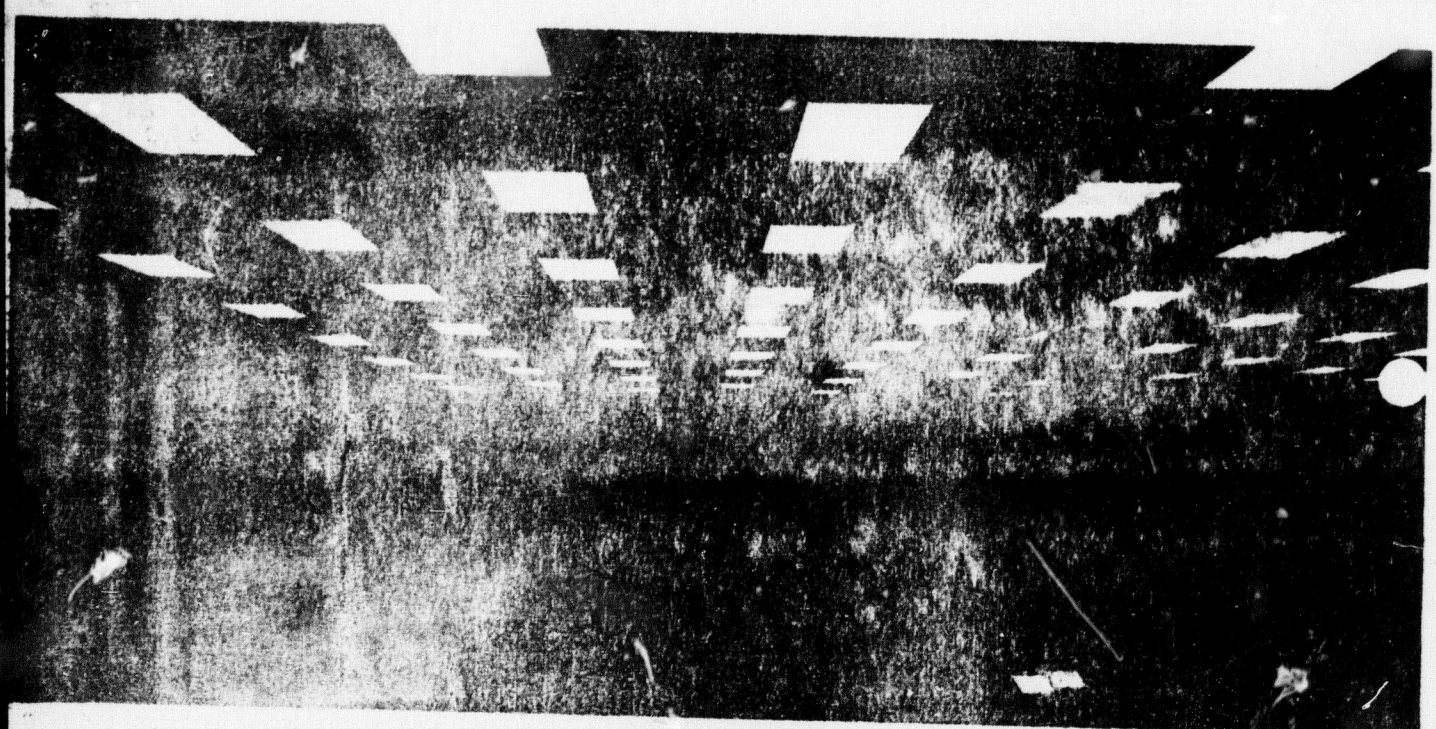
Tegular Minatone provides a distinctive lay-in ceiling. Size is 24" x 24", with all four edges rabbeted to allow the surface of the tile to extend 1/32" below the grid surface. Available in Fissured and Cortega surface designs.

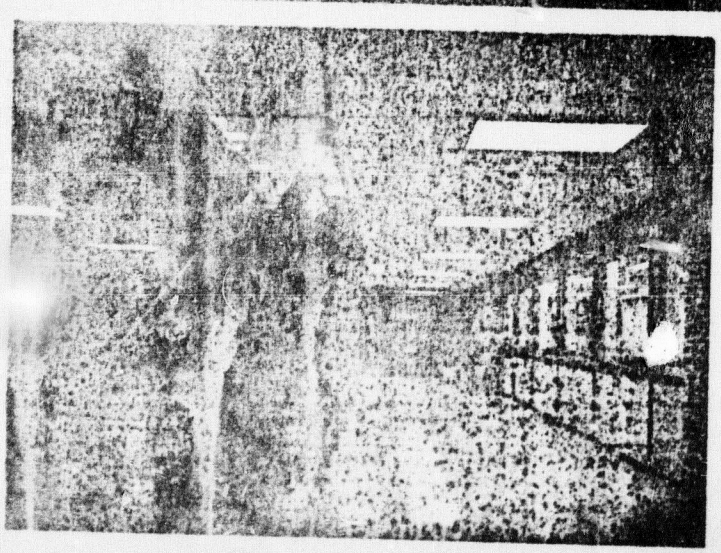
Flame Spread—Minaboard and Minatone items are rated Class 25 according to Federal Specification SS-S-118A. They also carry Underwriters' Laboratories, Inc., label and have a Class 25 Flame-Spread Rating when tested according to ASTM E84.

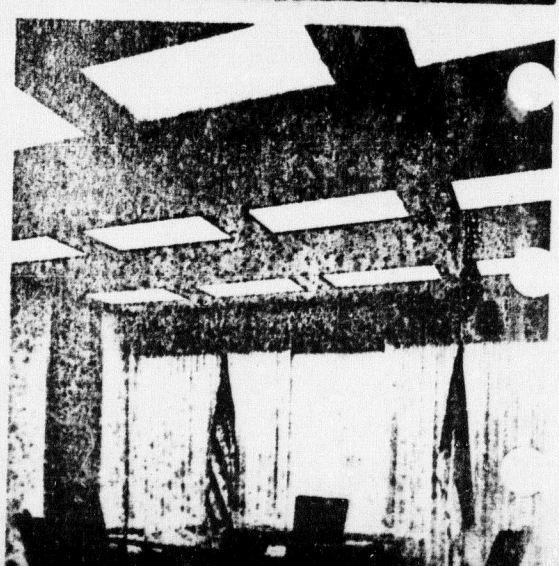
Insulation Value—Average C factor (at 75 F) is .55 for 5/8" Minaboard; .70 for 3/8" Minatone.

Surface Finish—Factory-applied, washable, white vinyl latex paint finish. Fissured and Classic are also available with a vinyl-plastic finish.

Installation—Lay-in units rest on the flanges of exposed-grid suspension system.







Armstrong Acoustical Fire Guard products offer a wide selection of fire-resistive lay-in ceilings, available in a variety of surface patterns and sizes.

Flame Spread—Rated Class 25 under the Flame-Spread Index section of Federal Specification SS-S-118A. Have Class 25 Flame-Spread Rating when tested according to ASTM E84. Carry Underwriters' Laboratories, Inc., label.

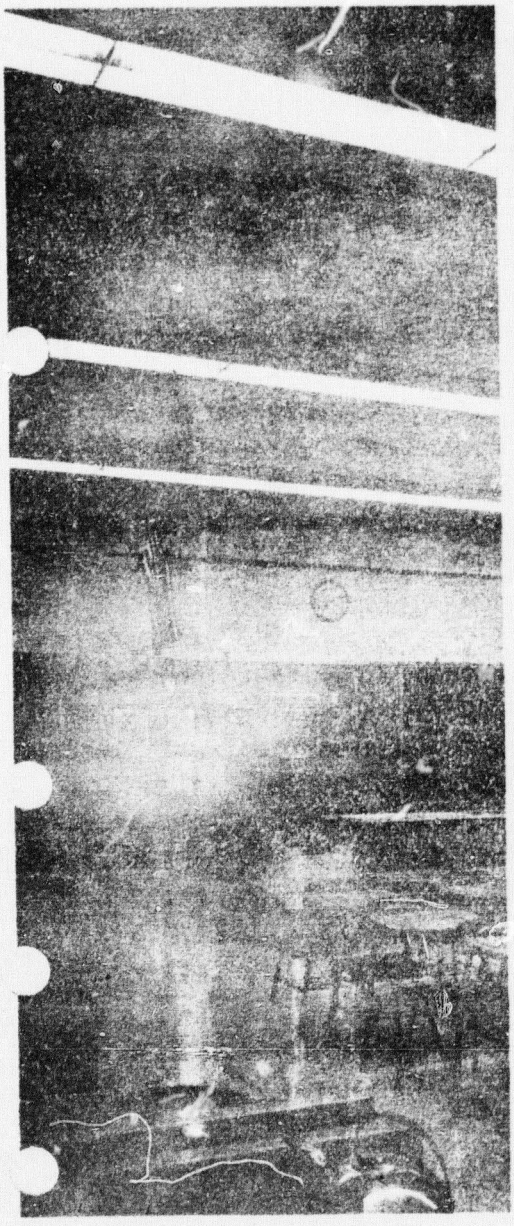
UL Time-Design Ratings—Hold official 1-, 2-, 3-, and 4-hour time-design ratings as fire-resistive ceilings in various assemblies for noncombustible materials listed under Underwriters' Laboratories, Inc., Building Materials List.

Insulation Value—Average C factor (at 75 F) is .70 for ⅝".

Surface Finish—
A. Factory-applied, washable white vinyl latex paint finish.
B. Mylar®—completely dirt-resistive and washable polyester film facing adhered only to the four edges of field units; adhered to entire surface of border units (for cutting).

Lay-in Panel Installation—Lay-in units rest on exposed flanges of exposed-grid system.

*Ⓡ Du Pont Company



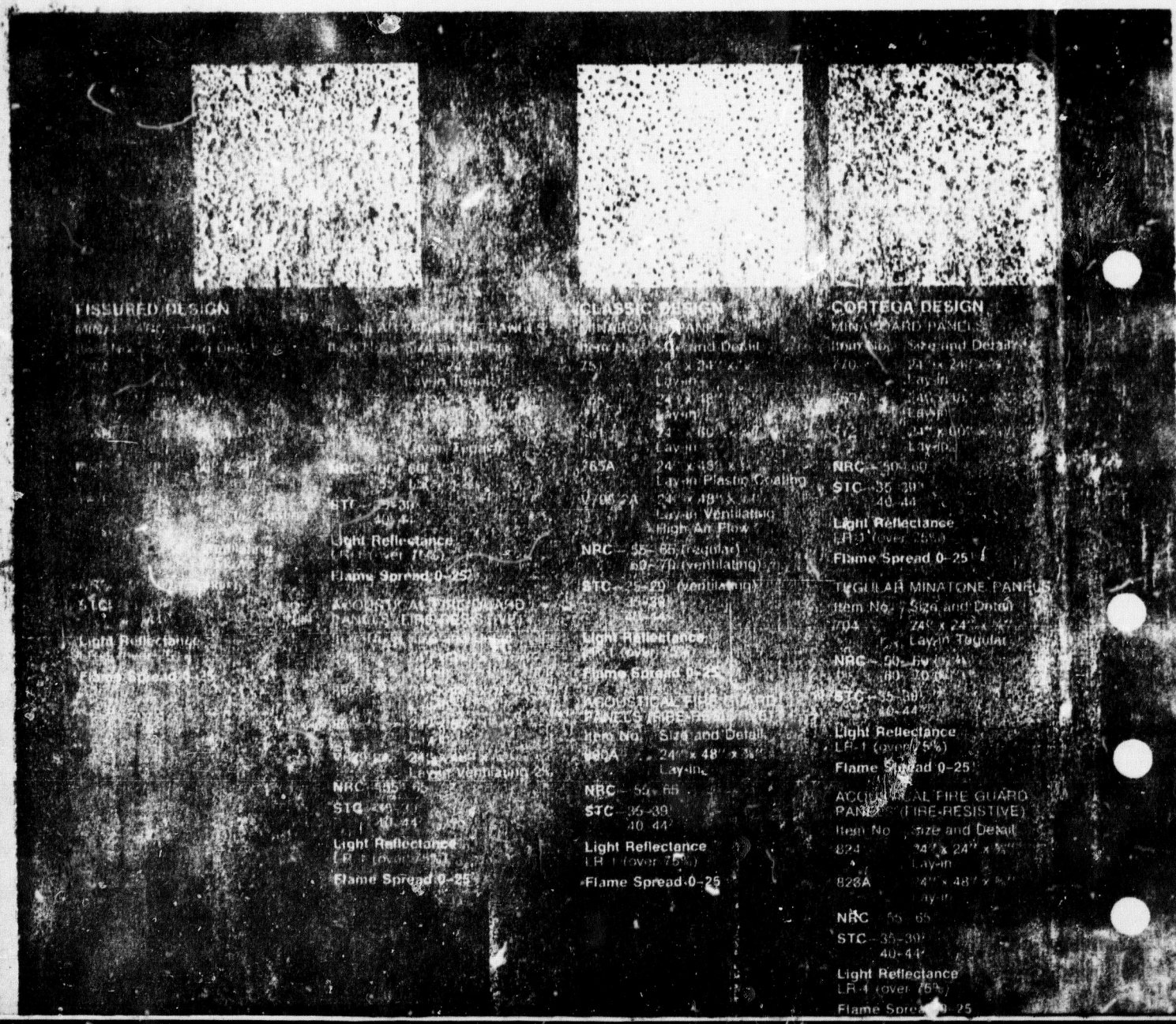


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Minaboard Panels,
Tegular Minatone,
Acoustical Fire Guard Panels

product data

Armstrong



GEORGIAN DESIGN
MINABOARD PANELS

Item No.	Size and Detail
764	24" x 24" x ⅝" Lay-in
763A	24" x 48" x ⅝" Lay-in
727	24" x 60" x ⅝" Lay-in
780	30" x 60" x ⅝" Lay-in

NRC—50–60
STC—35–39[1]
40–44[2]
Light Reflectance
LR-1 (over 75%)
Flame Spread 0–25[3]

ACOUSTICAL FIRE GUARD PANELS (FIRE-RESISTIVE)

Item No.	Size and Detail
899	24" x 24" x ⅝" Lay-in
898A	24" x 48" x ⅝" Lay-in

NRC—45–55
STC—35–39[1]
40–44[2]
Light Reflectance
LR-1 (over 75%)
Flame Spread 0–25[3]

DESIGN "E"
(MYLAR FACING)
ACOUSTICAL FIRE GUARD PANELS (FIRE-RESISTIVE)

Item No.	Size and Detail
882A	24" x 48" x ⅝" Lay-in Field Unit
884	24" x 48" x ⅝" Lay-in Border Unit

NRC—50–60 (field units)
STC—35–39[1]
40–44[2]
Light Reflectance
LR-1 (over 75%)
Flame Spread 0–25[3]

NOTES: [1]Continuous Ceiling
[2]Continuous Ceiling with Attend-Guard Treatment
[3]ASTM E84) 25
(Fed. Spec. SS-S-118A) Class 25
(UL Label) 25 or under

Lay-in Ceilings

Travertone,
Travertone
Fire Guard

Armstrong

Armstrong Travertone panels are made of mineral wool in standard-type lay-in panels and in Tegular lay-in form. All are 24" x 24" in size. Tegular units are rabbeted on all four sides, allowing the face of each panel to extend downward 1/32" below the grid surface. A bold and exciting dimensional effect is created.

Travertone Fire Guard Panels—These units hold official 1-, 2-, and 3-hour time-design ratings as fire-resistive ceilings in various assemblies listed under Underwriters' Laboratories, Inc., Building Materials List (see pages 56 thru 59 of this catalog)

Flame Spread—All Travertone items are rated Class 25 under the Flame-Spread Index section of Federal Specification SS-S-118A. They also have a Class 25 Flame-Spread Rating when tested according to ASTM E84. Carry Underwriters' Laboratories, Inc., label.

exposed flanges of exposed-grid system.

Insulation Value—Average C factor at 70 F is .70 for ¾" Travertone.

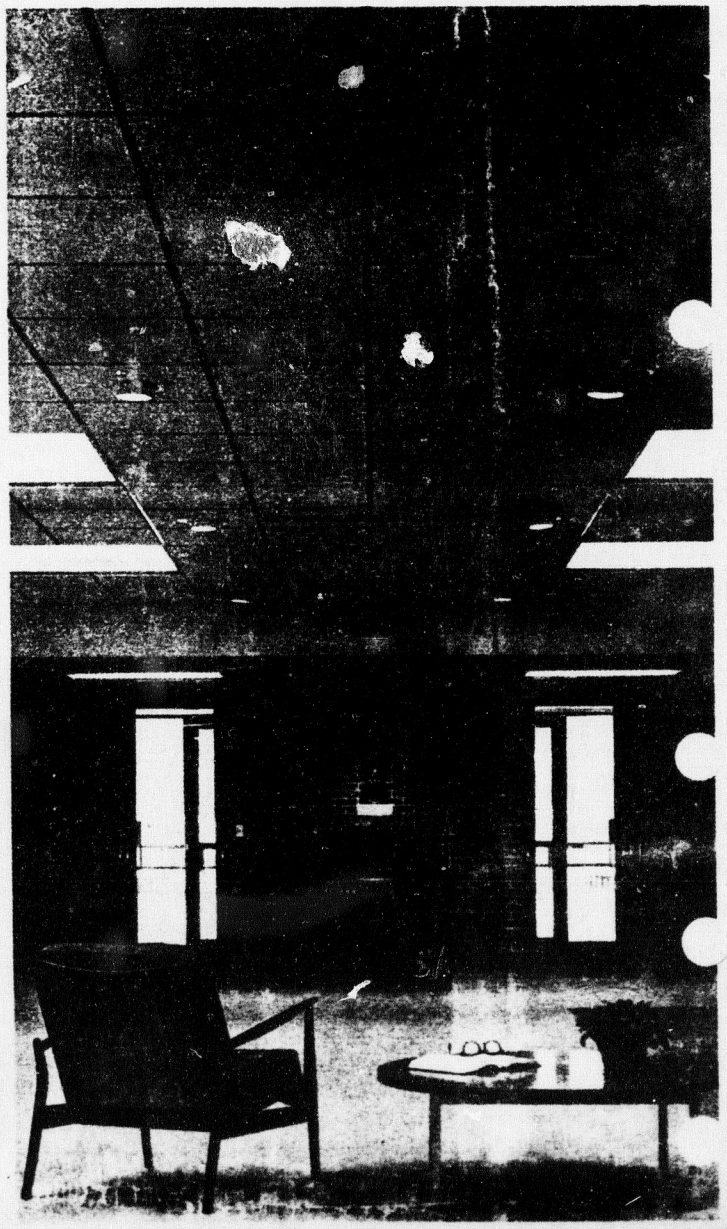
Surface Finish—Factory-applied, washable, white vinyl latex paint finish.

Attenu-Guard Treatment Available—Where excellent sound-transmission-loss properties are required, Travertone is available with special Attenu-Guard Treatment.



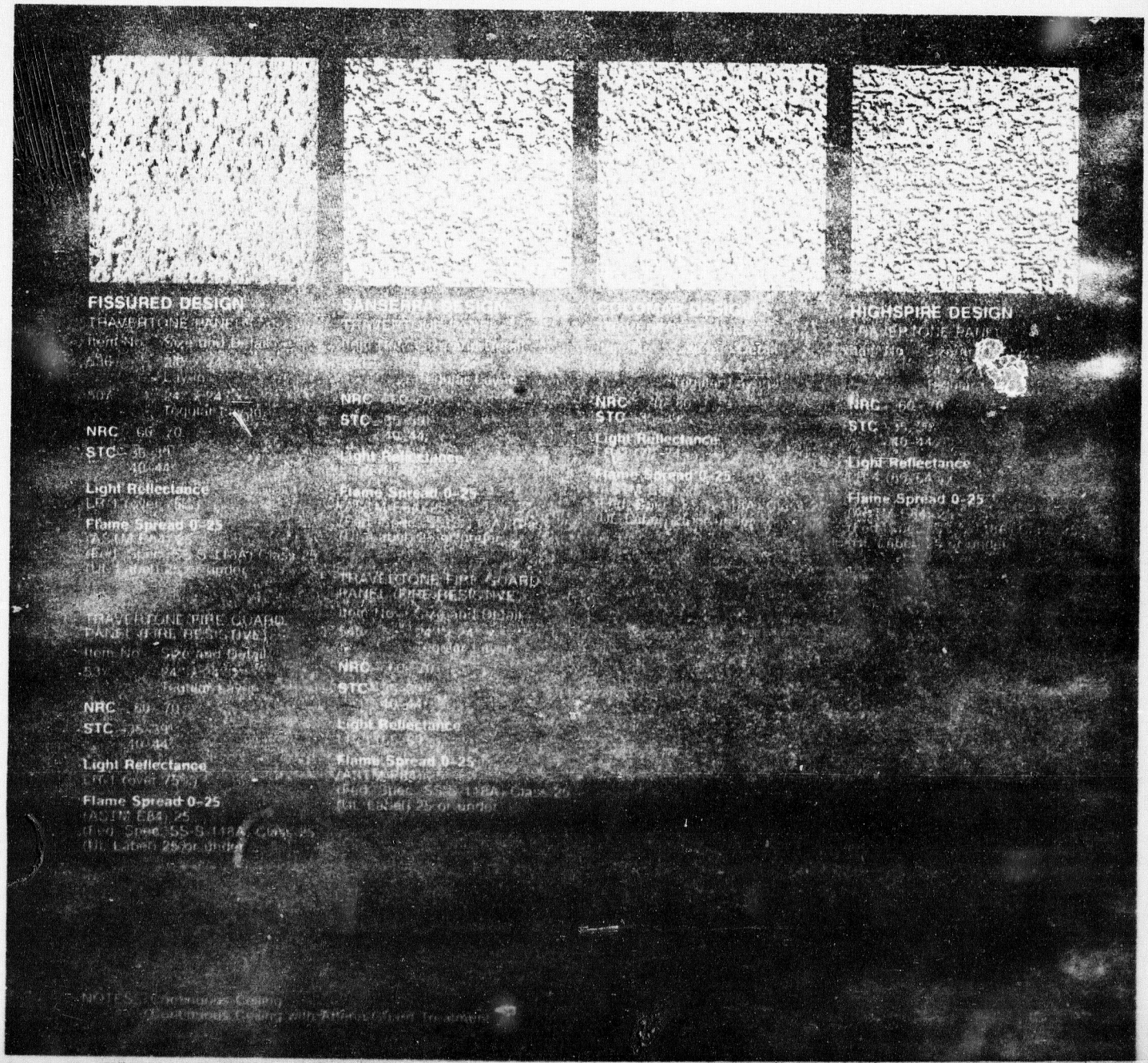






Travertone,
Travertone Fire Guard

product data



Tile Ceilings

Minatone,
Acoustical
Fire Guard

Armstrong

Armstrong Minatone is a highly efficient, fire-resistive mineral fiber material in tile form. It is repaintable, easy to install, and is available in a variety of surface designs, sizes, thicknesses, and edge details.

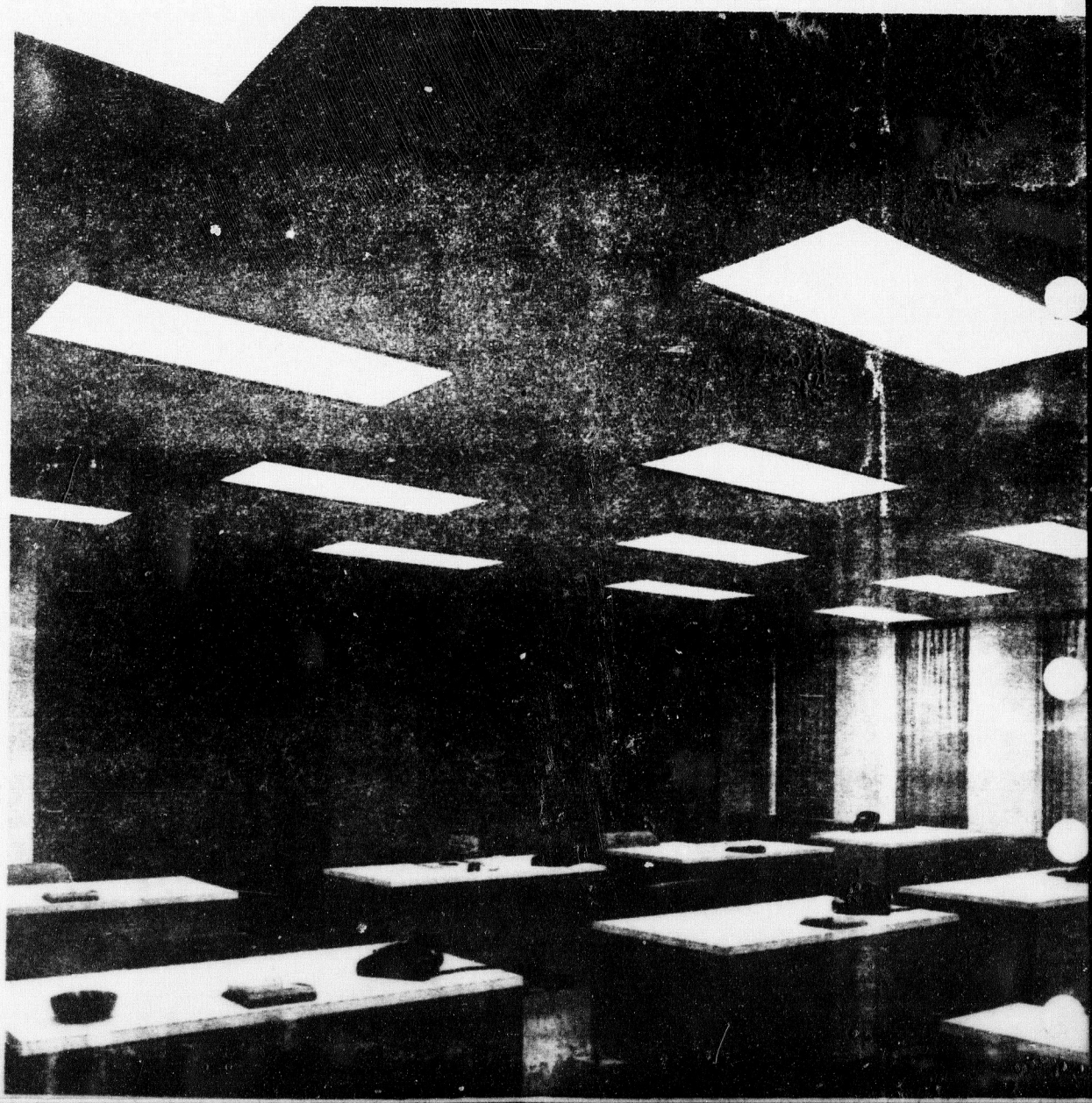
Flame Spread—Rated Class 25 under the Flame-Spread Index section of Federal Specification SS-S-118A. Have Class 25 Flame-Spread Rating when tested according to ASTM E84. Carry Underwriters' Laboratories, Inc. label.

Insulation Value—Average C factor (at 75 F) is .65 (¾" thickness); .70 (⅝" thickness); .75 (½" thickness).

Surface Finish—Factory-applied, washable, white latex paint finish. Also available with special acrylic finish.

Self-Leveling Tongue-and-Groove Joint—Interlocking tongue-and-groove tile edges assure a level, monolithic appearance.

ceiling structure or suspended from a mechanical system. Mechanical systems may be semi-exposed or concealed types. Where a completely accessible, concealed system is desired, the Armstrong Accessible Tile System (ATS) meets design requirements.



Armstrong Acoustical Fire Guard Ceilings offer a wide selection of fire-resistive tile and lay-in ceilings, available in a variety of surface patterns and sizes.

UL Time-Design Ratings—Hold official 1-, 2-, and 3-hour time-design ratings as fire-resistive ceilings in various assemblies listed under Underwriters' Laboratories, Inc., Building Materials List.

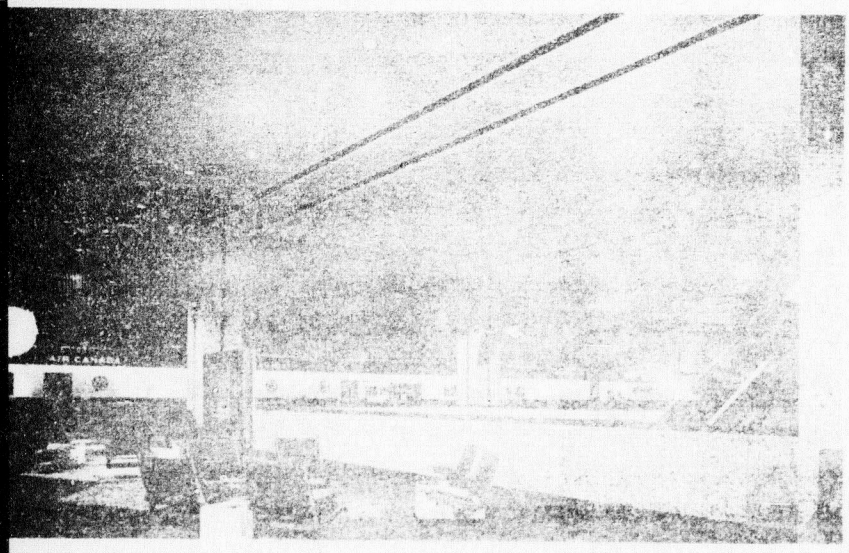
Flame Spread—Rated Class 25 under the Flame-Spread Index section of Federal Specification SS-S-118A. Have Class 25 Flame-Spread Rating when tested according to ASTM E84. Carry Underwriters' Laboratories, Inc., label.

Insulation Value—Average C factor (at 75 F) is .70 for ⅝".

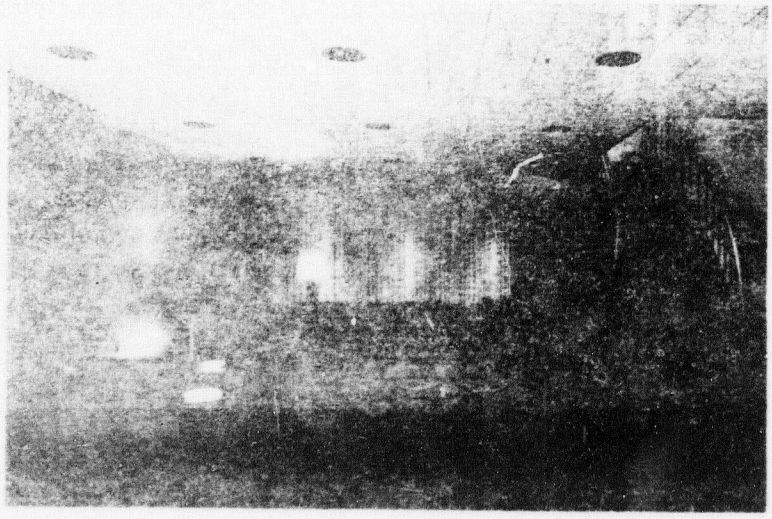
Surface Finish—Factory-applied, washable, white vinyl latex paint finish. Mylar—completely dirt-resistive and washable polyester film facing adhered only to the four edges of field units; adhered to entire surface of border units (for cutting).

Self-Leveling Tongue-and-Groove Tile Joints—Interlocking tongue-and-groove tile edges assure a level, monolithic appearance.

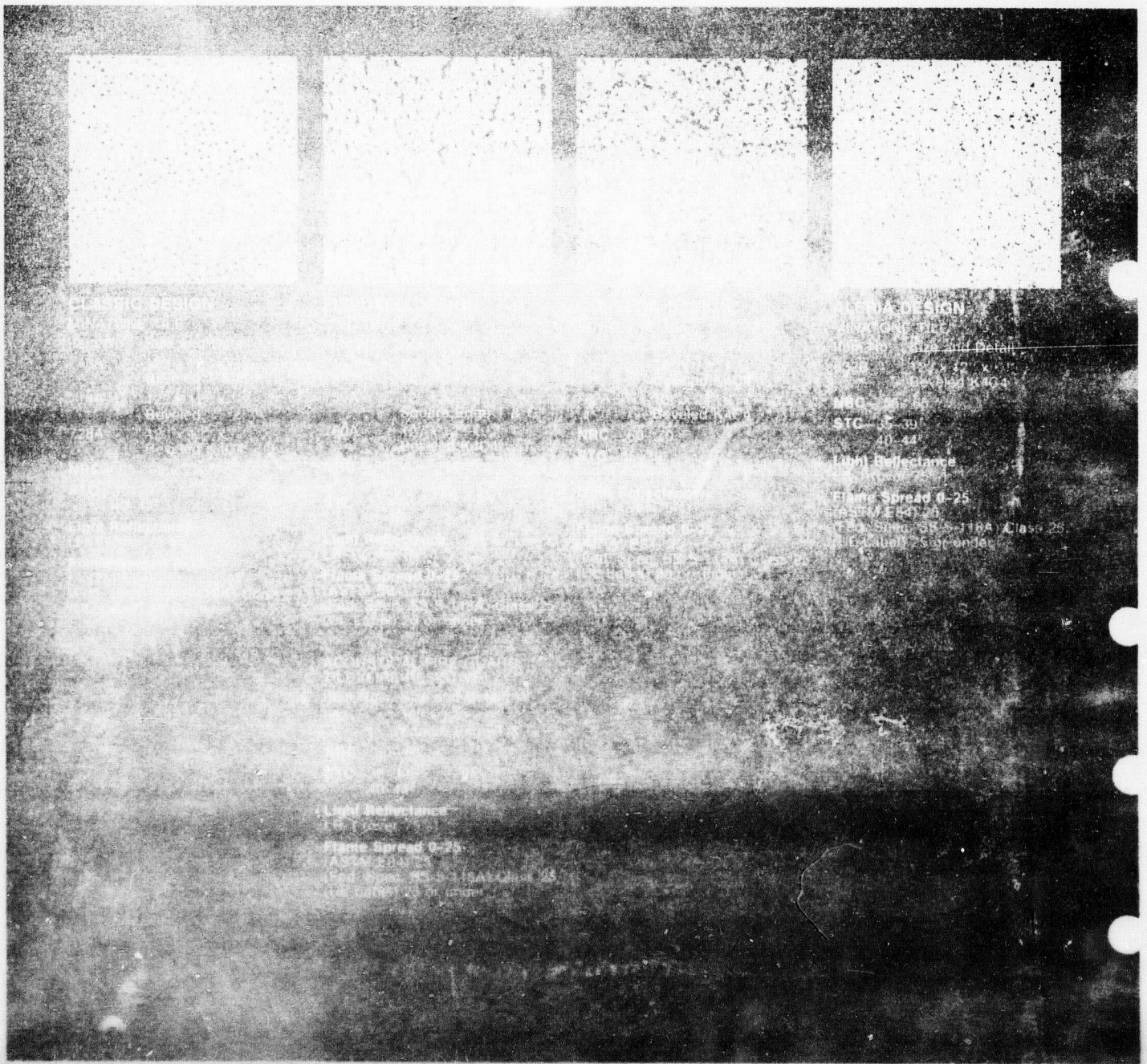
Tile Installation—Conventional-type concealed system. Underwriters' Laboratories ratings include direct attachment of suspension system to steel or wood joists; suspension on 1½" carrying channels.



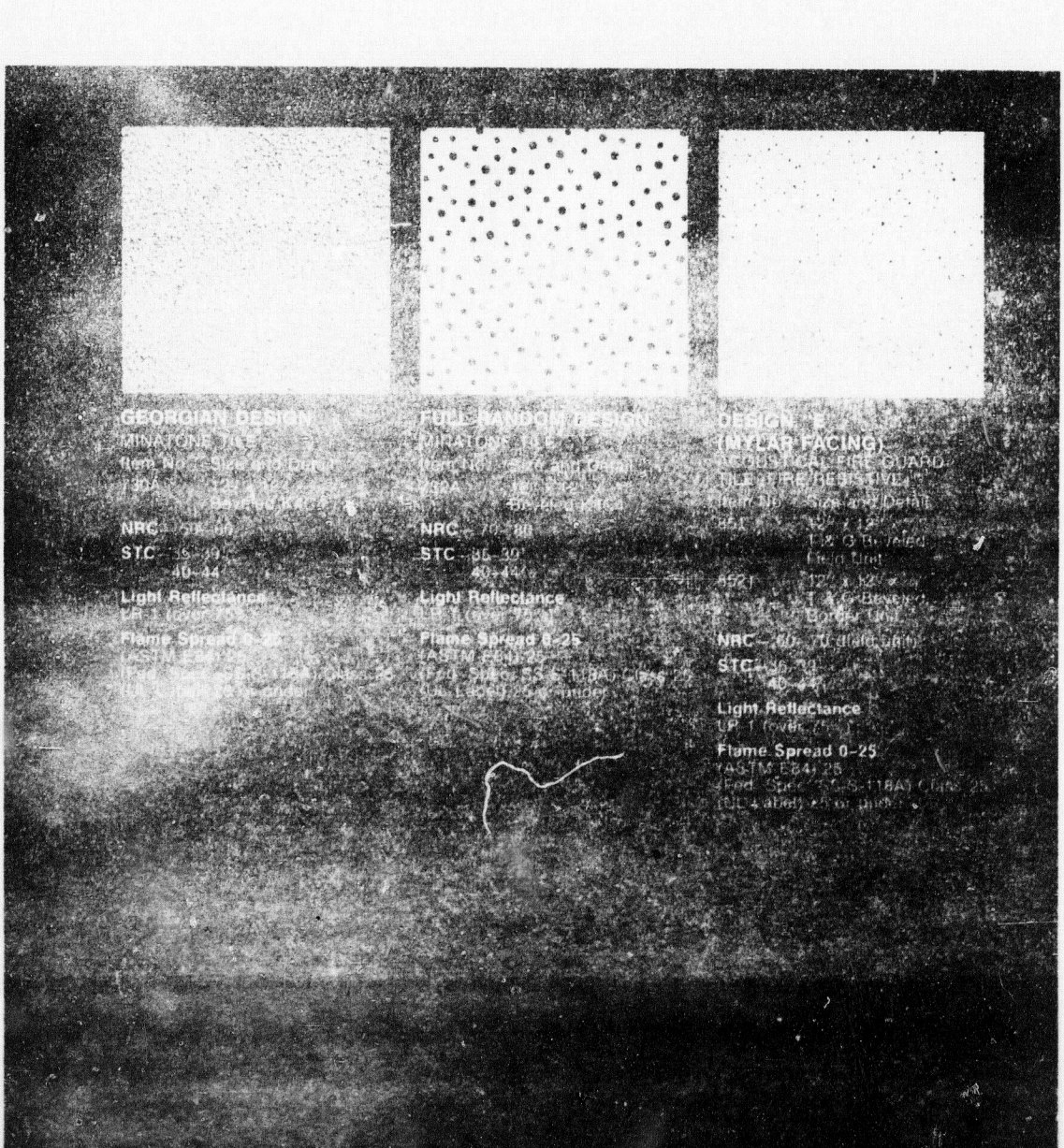




Tile
Ceilings
Minatone
Acoustical
Fire Guard
product data



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Tile Ceilings

Travertone,
Travertone
Fire Guard

Armstrong Travertone Tile is a highly efficient, luxury-quality mineral wool ceiling product. It is repaintable, easy to install, and available in a variety of surface designs, sizes, and edge details.

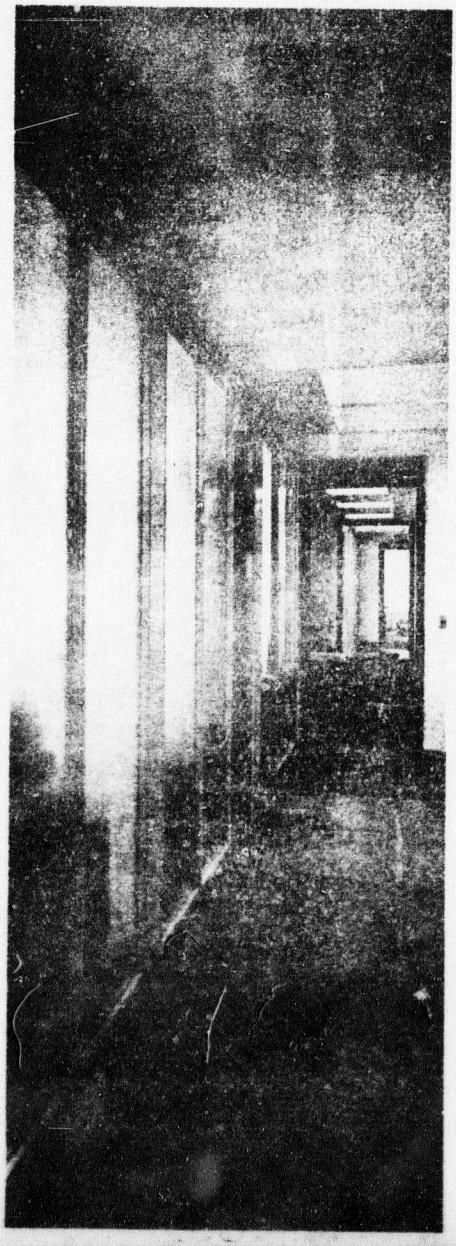
Insulation Value—Average C factor (at 75 F) is .70 at ¾".

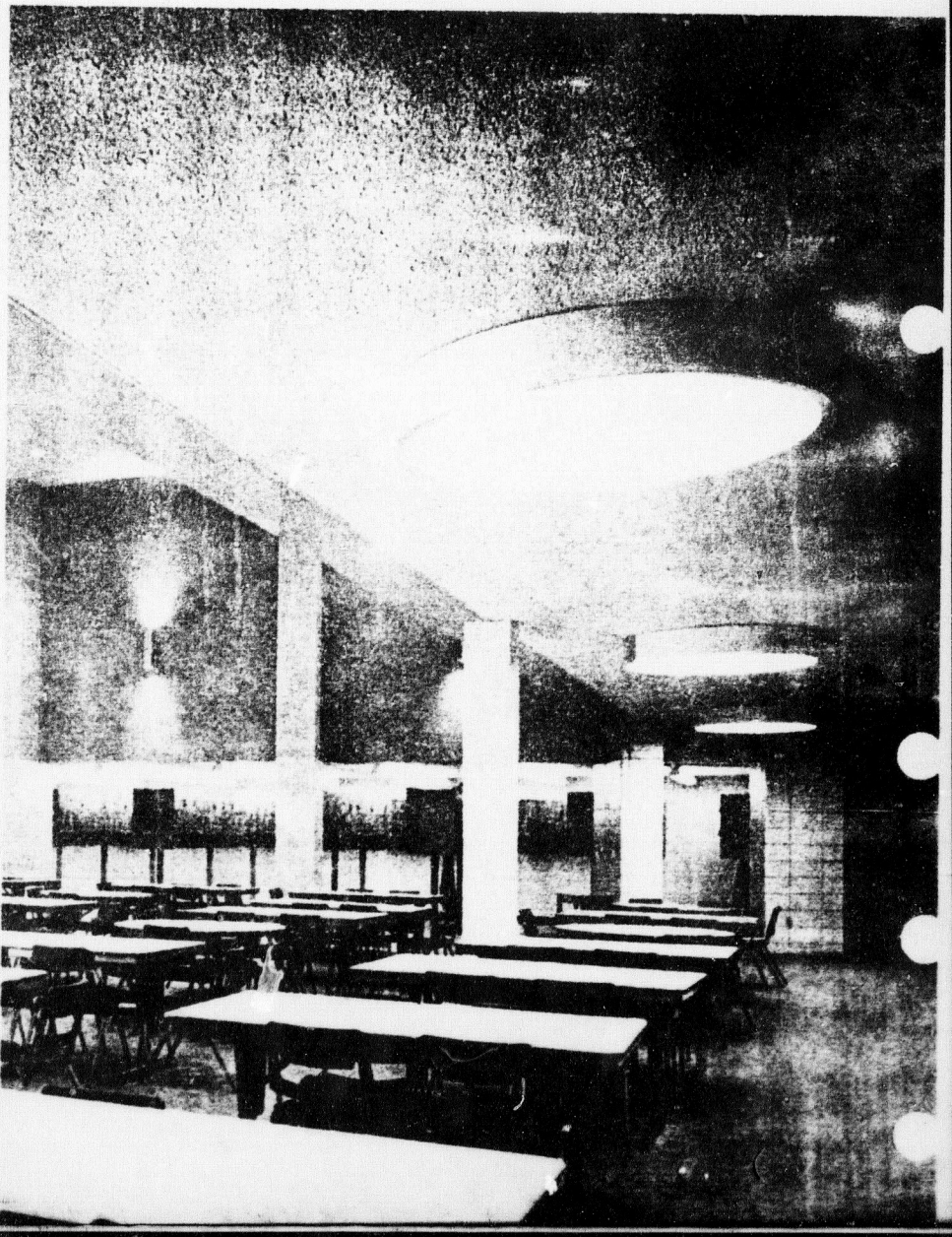
Attenu-Guard Treatment—Where sound-transmission-loss properties are required, Travertone is available with special Attenu-Guard Treatment. (See Armstrong representative for complete details.)

Self-Leveling Tile—On Travertone tile, interlocking tongue-and-groove edges assure a level, monolithic appearance.

Installation of Tile—Tile may be cemented directly to sound ceiling structure or suspended from a mechanical system. Mechanical systems may be semi-exposed or concealed types. Where a completely accessible, concealed system is desired, the Armstrong Accessible Tile System (ATS) meets design requirements.

[illegible] designs are available as ventilating ceiling systems. With ventilating ceilings, conditioned air enters the plenum through a stub-duct opening and is forced under low and even pressure through perforations in the ceiling tile or panel, conditioning the space below. A comfortable, draft-free environment results. This sophisticated approach to air conditioning eliminates unsightly diffusers and greatly reduces the amount of supply-air ductwork needed.





109 a

Armstrong Travertone Fire Guard Tile is a fire-resistive mineral-fiber product made in a variety of surface patterns and edge details.

UL Time-Design Ratings—Hold official 1-, 2-, and 3-hour time-design ratings as fire-resistive ceilings in various assemblies listed under Underwriters' Laboratories, Inc., Building Materials List.

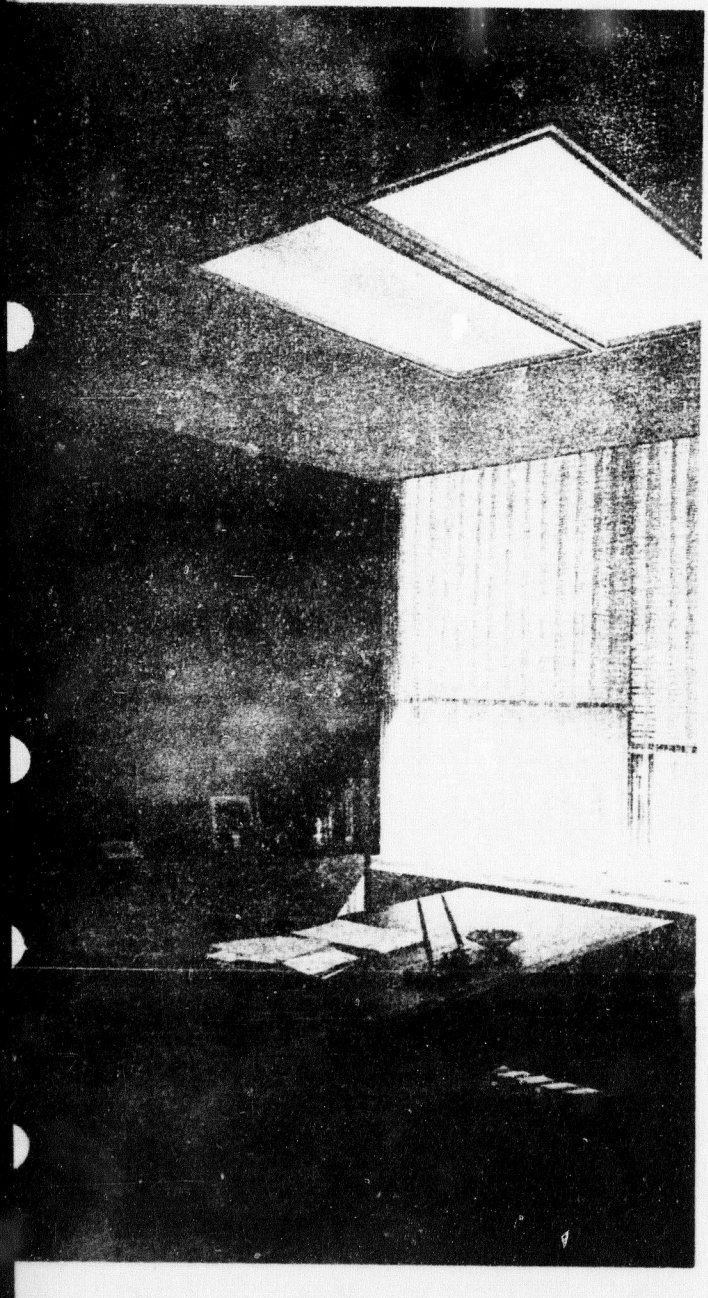
Flame Spread—Rated Class 25 under the Flame-Spread Index section of Federal Specification SS-S-118A. Have Class 25 Flame-Spread Rating when tested according to ASTM E84. Carry Underwriters' Laboratories, Inc., label.

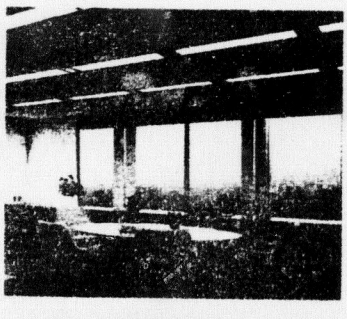
Insulation Value—Average C factor (at 75 F) is .70 at ¾".

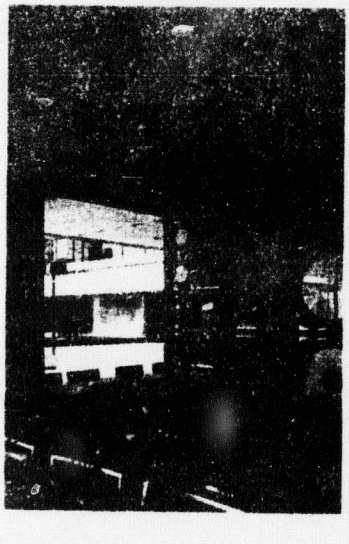
Surface Finish
Factory-applied, washable, white vinyl latex paint finish.

Self-Leveling Tongue-and-Groove Joint—Interlocking tongue-and-groove tile edges assure a level, monolithic appearance.

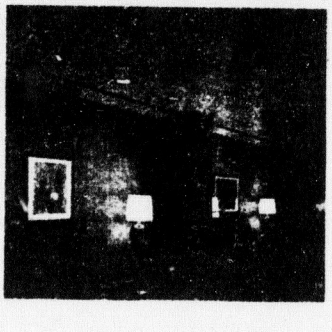
Installation—Conventional-type concealed system. Underwriters' Laboratories ratings include direct attachment of suspension system to steel or wood joists; suspension on 1½" carrying channels.







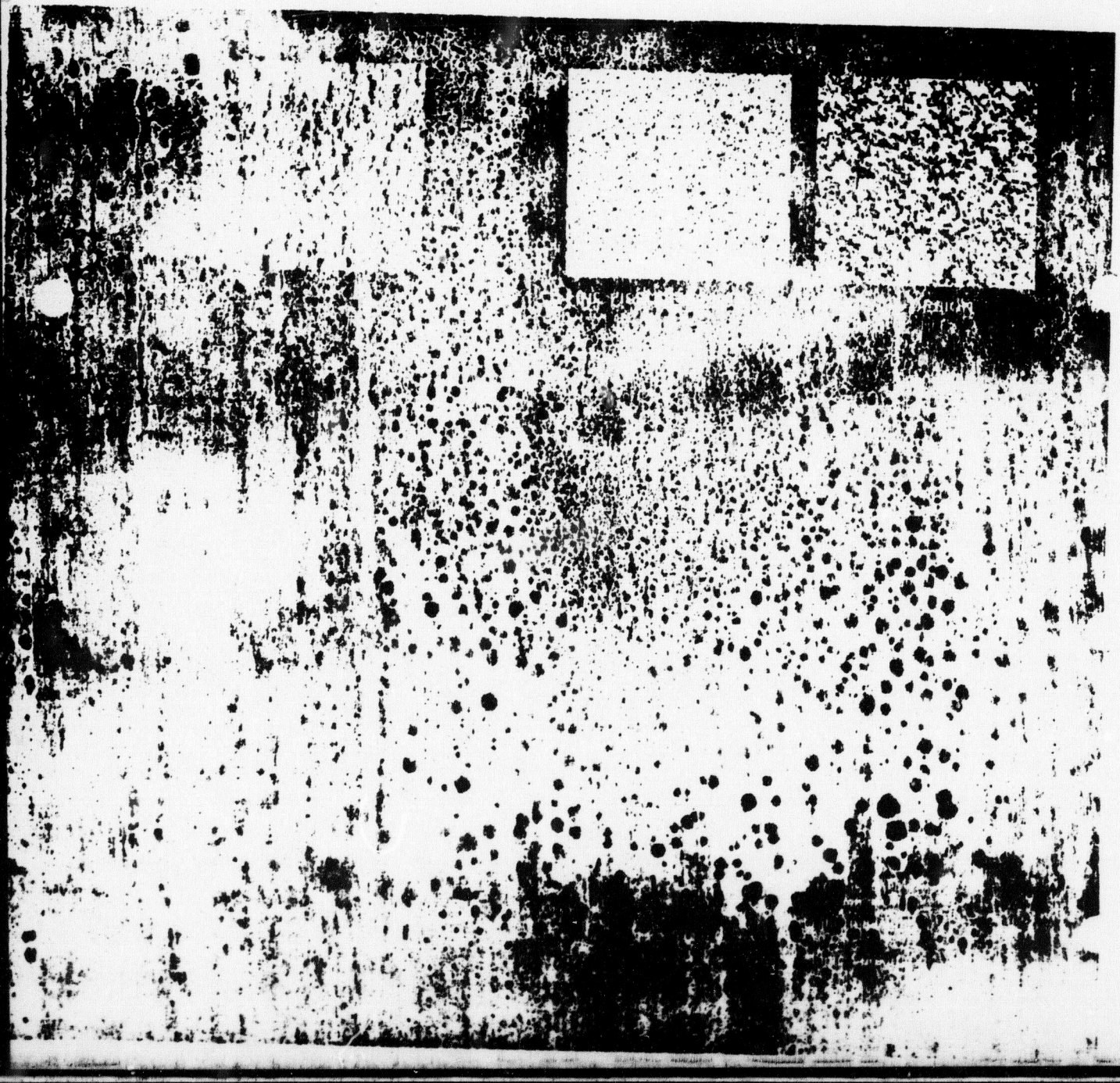




Travertone
Travertone Fire Guard Tile

product data

110 a





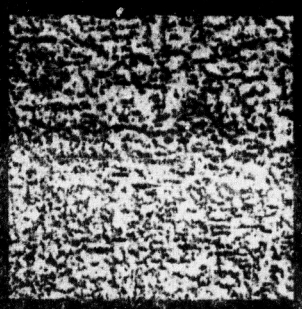
GRANDSHIRE DESIGN
TRAVERTONE TILE
Item No. Size and Detail
520 12" x 12" x ⅝"
Square Edge #4C4

NRC .60-.70
STC .35-.39
.40-.44
Light Reflectance
LR-3 (65-69%)
Flame Spread 0-25
(ASTM E84) 25
(Fed. Spec. SS-S-118A) Class 25
(UL Label) 25 or under



COLOMAR DESIGN
TRAVERTONE TILE
Item No. Size and Detail
527 12" x 12" x ⅝"
Eased Edge #4C4

NRC .70-.80
STC .35-.39
.40-.44
Light Reflectance
LR-2 (70-74%)
Flame Spread 0-25
(ASTM E84) 25
(Fed. Spec. SS-S-118A) Class 25
(UL Label) 25 or under



HIGHSPIRE DESIGN
TRAVERTONE TILE
Item No. Size and Detail
596 12" x 12" x ⅝"
Square Edge #4C4

NRC .60-.70
STC .35-.39
.40-.44
Light Reflectance
LR-4 (60-64%)
Flame Spread 0-25
(ASTM E84) 25
(Fed. Spec. SS-S-118A) Class 25
(UL Label) 25 or under

TRAVERTONE FIRE GUARD
(NOT FIRE RESISTIVE)
Item No. Size and Detail
[illegible] 12" x 12" x ⅝"
Square Edge #4C4

NRC .60-.70
STC .35-.39
.40-.44
Light Reflectance
LR-4 (60-64%)
Flame Spread 0-25
(ASTM E84) 25
(Fed. Spec. SS-S-118A) Class 25
(UL Label) 25 or under

NOTES: Continuous Ceiling
Combustible Ceiling with Sprinkler System

time/design ratings



CONCRETE THICKNESS	UNIT SIZE & TYPE*	UNIT THICKNESS	FIXTURE PENETRATION (ft^2/100 ft^2)	DUCT PENETRATION ($in.^2$/100 ft^2)	DESIGN NUMBER
#1 Concrete on Flat Cellular Deck					
4-Hour—Concealed Grid					
2½"	12" x 12"; P	¾" or ⅝"	None	None	A011 (21-3)
	12" x 12"; P	¾" or ⅝"	25	576	A012 (21-4)
#2 Concrete on Flat Cellular, Fluted, or Blend Deck					
4-Hour—Concealed Grid					
2½"	12" x 12"; P	¾" or ⅝"	None	None	A011 (21-4)
	12" x 12"; P	¾" or ⅝"	25	576	A012 (21-4)
3-Hour—Exposed Grid					
3"	24" x 48"; P or PC	⅝"	24	288	A211 (23-2)
2¼"	48" x 48"; PC	⅝"	24	168	A212 (200-3)
	36" x 60"; PC				
	30" x 60"; PC				
3-Hour—Concealed Grid					
3½"	Pentaflex Luminaire; P	⅝"	16	576	D008
2½"	12" x 12"; BF or P	¾"	12	576	A008 (39-3)
2-Hour—Exposed Grid					
2½"	24" x 48"; P or PC	⅝"	None	None	D208 (13-2)
	24" x 24"; P or PC				
	24" x 48"; P or PC	⅝"	24	576	A210 (220-3)
	24" x 24"; P or PC				
	48" x 48"; PC	¾"	24	576	A202 (446-2)
	36" x 60"; PC				
	36" x 36"; PC				
	30" x 60"; P or PC				
	30" x 30"; P or PC				
	24" x 60"; P or PC				
	24" x 48"; P or PC				
	24" x 36"; P or PC				
	24" x 24"; P or PC				
2¾" or 3"	C-Series Luminaire; P	1" s/o ⅝"	100 (Vaulted)	288 or BALD	D211 (273-2)
	Symmetry Luminaire; P	⅝"	50	127 or Air Bars	D212
2-Hour—Concealed Grid					
2½"	Pentaflex Luminaire; P	⅝"	16	288	D008
1½-Hour—Exposed Grid					
2½"	Symmetry Luminaire; P	⅝"	50	127 or Air Bars	D212
#3 Concrete on Ribbed or Corrugated Deck					
3-Hour—Concealed Grid					
3½"	12" x 12" to 12" x 36" or 12" x 12" to 24" x 24"; BF, P or PC	¾" (BF or P) or ⅝" (PC)	25	288	G033 (218-3)
3-Hour—Exposed Grid					
3¼"	24" x 48"; P	⅝"	20	113	G229 (232-3)
2-Hour—Concealed Grid					
2½"	12" x 12" to 12" x 36" or 12" x 12" to 24" x 24"; BF, P or PC	¾" (BF) or ⅝" (P or PC)	25	288	G031 (217-2)
	24" x 24"; BF or P	¾" (BF) or ⅝" (P)	25	576	G028 (217-2)
2¼"	12" x 12"; BF or P	⅝"	24	288	G023 (217-2)
2-Hour—Exposed Grid					
3"	24" x 48"; P or PC	⅝"	8	[illegible]	G209 (232-3)
	24" x 24"; P or PC				
2½"	24" x 48"; P	⅝"	None	[illegible]	[illegible]
	24" x 24"; P				
2¼"	24" x 48"; P	⅝"	20	113	[illegible]
	24" x 24"; P				

CONCRETE THICKNESS	UNIT SIZE & TYPE*	UNIT THICKNESS	FIXTURE PENETRATION (ft^2/100 ft^2)	DUCT PENETRATION ($in.^2$/100 ft^2)	DESIGN NUMBER
#4 Concrete on Metal Lath					
3-Hour—Concealed Grid					
3"	12" x 12" to 12" x 36" or 12" x 12" to 24" x 24"; BF or P	¾"	None	None	G030 (57-3)
3-Hour—Exposed Grid					
3¼"	24" x 48"; P	⅝"	20	113	G229 (232-3)
2-Hour—Concealed Grid					
2½"	24" x 24"; BF or P	¾" (BF) or ⅝" (P)	25	576	G028 (92-2)
	12" x 24"; BF or P	¾"	16	57	G022 (285-2)
	12" x 12" to 12" x 36" or 12" x 12" to 24" x 24"; BF, P or PC	¾" (BF) or ⅝" (P or PC)	25	288	G031 (287-2)
2"	12" x 12"; P	¾" or ⅝"	None	None	G032 (8-2)
2-Hour—Exposed Grid					
3"	24" x 48"; P or PC	⅝"	8	None	G209 (46-2)
	24" x 24"; P or PC				
	24" x 48"; PC or P	⅝"	24	576	G244 (240-2)
	24" x 24"; PC or P				
	C-Series Luminaire; P	1" a/o ⅝"	100	288 or SALD	G212 (242-2)
2½"	24" x 48"; P	⅝"	None	None	G236 (21-2)
	24" x 24"; P				
	24" x 48"; P or PC	⅝"	8	57	G217 (53-2)
	24" x 24"; P or PC				
	24" x 48"; P or PC	⅝"	8	None	G216 (74-2)
	24" x 24"; P				
	24" x 48"; P or PC	⅝"	8	None	G242 (210-2)
	24" x 24"; P or PC				
	24" x 48"; P	⅝" or ½"	16	57	G243 (230-2)
	24" x 24"; BF or P	¾"	24	113	G210 (253-2)
	24" x 48"; P	⅝"	20	113	G229 (324-2)
	24" x 24"; P				
1½-Hour—Concealed Grid					
2"	12" x 12"; BF or P	¾" (BF) or ⅝" (P)	2⅓	576	G027 (7-1½)
	24" x 24"; BF or P	¾" (BF) or ⅝" (P)	25	576	G029 (21-1½)
1½-Hour—Exposed Grid					
2"	24" x 48"; P or PC	⅝" (P or PC) or ½" (P)	None	None	G239 (9-1½)
1-Hour—Exposed Grid					
2"	24" x 48"; P	⅝" or ½"	None	None	G241 (32-1)
	24" x 24"; P				
#7 Double-Ply Wood (or plywood), 2 x 10 Wood Joists					
1-Hour—Concealed Grid					
N.A.	12" x 12"; P	¾" or ⅝"	None	None	L004 (9-1)
1-Hour—Exposed Grid					
N.A.	24" x 48"; P	⅝" or ½"	16	110	L209 (30-1)
N.A.	24" x 48"; P	⅝" or ½"	24	227	L210 (51-1)
#8 Double-Ply Wood (or plywood), 3 x 8 Wood Joists					
1½-Hour—Exposed Grid					
N.A.	24" x 48"; P or PC	⅝"	None	None	L208 (8-1½)
	24" x 24"; P				
#9 Double Plywood, Wood and Steel Joists					
¾-Hour—Exposed Grid					
N.A.	24" x 48"; P	1"	24	127	L203

time/design ratings

Armstrong

	CONCRETE THICKNESS	UNIT SIZE & TYPE*	UNIT THICKNESS	FIXTURE PENETRATION (ft^2/100 ft^2)	DUCT PENETRATION ($in.^2$/100 ft^2)	DESIGN NUMBER
#10 Precast Concrete Plank						
2-Hour—Concealed Grid						
	2"	12" x 12"; BF or P	¾"	None	None	P004 (RC4-2)
		12" x 12"; BF or P	¾" (BF) or ⅝" (P)	12	126	P001 (RC14-2)
#12 Lightweight Insulating Concrete on Ribbed or Corrugated Deck						
2-Hour—Exposed Grid						
	2"	24" x 48" PC + 24" x 48" Gyp. Bd	⅝" + ½"**	16	57	P215 (RC24-2)
	2"	24" x 48" PC + 24" x 48" Gyp. Bd.	⅝" + ½"**	16	57	P219
1-Hour—Exposed Grid						
	2"	24" x 48"; P	⅝" or ½"	16	57	P216 (RC8-1)
#13 Mineral Fiber Roof Insulation on Fluted Metal Roof Deck						
	INSULATION THICKNESS					
1½-Hour—Exposed Grid						
	1" Minimum to Unlimited Maximum	24" x 48"; P	⅝"	24	255	P225
1-Hour—Exposed Grid						
	1" to 3"	24" x 48"; PC	⅝"	16	57	P211 (RC3-1)
	1"	24" x 48"; PC	⅝"	16	57	P210 (RC4-1)
	1½"	C-Series Luminaire; P	1" and ⅝"***	100	126 or SALD	P209 (RC6-1)
	1"	24" x 48"; P	⅝"	16	113	P206 (RC16-1)
1-Hour—Exposed Grid						
	1" Minimum to Unlimited Maximum	24" x 24" 24" x 48"; P or PC	⅝"	24	576	
	1" Minimum to Unlimited Maximum	C-Series Luminaire; P	¾" and ⅝"****	100	255 or SALD	P224
#16 Poured Gypsum Concrete Over ½" Gypsum Formboard						
	CONCRETE THICKNESS					
1½-Hour—Exposed Grid						
	1½"	24" x 60"; P	⅝"	16	288	P217 (RC6-1½)

*P— Fire Guard
PC—Ceramaguard
BF—Travertone Fire Guard
**⅝" Ceiling Panels *plus* ½" Gypsum Board
***1" flat areas, ⅝" vaults
****¾" flat areas, ⅝" vaults
NOTE Under no circumstances should thermal insulation be installed on the back of panels in fire-rated ceilings unless so designated in the specific fire-resistance design assigned to the structure.

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guide specification

Armstrong Lay-in and Tile Ceilings

1. ACOUSTICAL MATERIALS

1.1 Acoustical materials shall be Armstrong Cork Company: (Travertone) (Travertone Fire Guard) (Minaboard) (Fire Guard Lay-in) (Minatone) (Fire Guard Tile)

1.1.1 Acoustical materials shall be Type ( ) and Pattern ( ) according to Federal Specification SS-S-118A; Tile or Panel Size ( ); Thickness ( ); Edge Detail ( ).

1.1.2 Acoustical materials shall have washable matte white finish with light reflectance of: (LR-1) (LR-2) (LR-3) according to Federal Specification SS-S-118A.

2. SUSPENSION

2.1 Suspension system shall be:

2.1.1 Concealed Z, H & T. Framing shall be ( ) gauge electrogalvanized steel.

2.1.2 Exposed grid. Framing shall be ( ) gauge electrogalvanized steel and shall be finished on exposed surfaces with (off-white enamel) (other).

2.2 Matching wall molding shall detachably support framing.

2.3 Framing shall comply with ASTM C635 Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings. Suspension system shall be classified (light) (intermediate) (heavy) duty. (Framing shall be suitable for severe environmental conditions of high humidity and salt spray.)

3. NOISE CONTROL

3.1 Acoustical materials shall have Noise-Reduction Coefficient (NRC) in the range (.50–.60) (.55–.65) (.60–.70) (.65–.75) (.70–.80), according to ASTM C423 Sound Absorption of Acoustical Materials in Reverberation Rooms.

3.2 Ceiling Sound-Transmission Class (STC) shall be in the range (35–39) (40–44) according to AMA 1-II Ceiling Sound-Transmission Test by Two-Room Method.

4. FIRE PROTECTION

4.1 Acoustical materials shall have Class 25 Flame-Spread index according to Federal Specification SS-S-118A.

4.2 Fire-rated installation shall comprise Armstrong Fire Guard tile or panels and shall conform to the applicable fire-rated Assembly Design(s).

Accessible Tile System

Armstrong

ATS is a completely accessible, concealed suspension system designed for Armstrong acoustical tile ceilings.

Accessibility

Any tile, anywhere, can be easily taken out by pulling the tile downward with a specially designed hook knife. Tile is replaced by snapping the cross tee back into the main runner. This unique system requires only 2¼" clearance above the ceiling line to top of main runner.

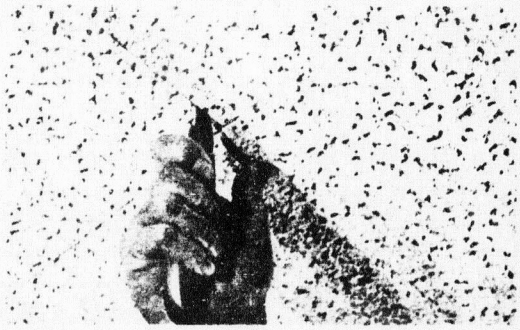
Flexibility

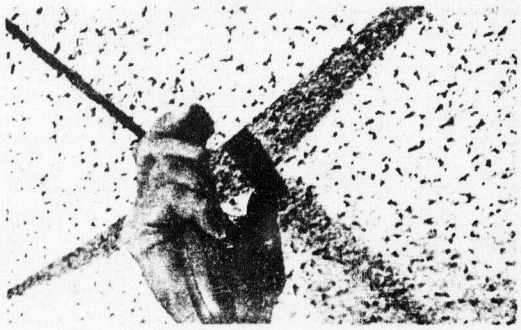
This system is readily adapted to changing design requirements. Ceiling tile, lighting fixtures, and interior partitions can easily be rearranged. The system is designed primarily for 12" x 12" and 12" x 24" Armstrong tile (¾" thick, kerfed and back-cut on all 4 sides).

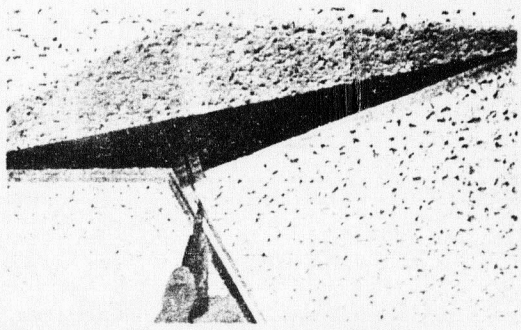
Structural Strength

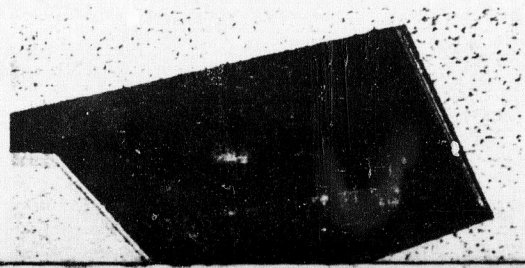
The level, nonshifting system has the strength necessary to support recessed grilles, diffusers, and troffer lights. Fixtures should be mounted prior to installation of ceiling tile and final adjustments made when ceiling is installed.

[illegible] alignment, strength, and modular accuracy of the Armstrong Accessible Tile System allow partitions to be installed and attached to it in any direction or rearrangement. Partition ceiling plates can be fastened to the flanges of main runners or into the center of cross tees by 1¼" self-tapping sheet-metal screws. Weight load including tile on cross tee should not exceed 6 pounds per 2 lineal feet. The Accessible Tile System is capable of withstanding partition loading up to 60 lb/lin ft of framing in either room direction without undue distortion or structural failure.











Sound-Transmission Resistance

An ATS installation has the same sound-attenuation factor as the acoustical tile used in the installation. With ¾" Minatone Ceiling STC Range is 45–49.

UL Time-Design-Rated Fire Protection

Armstrong Travertone Fire Guard, Pensacola Travertone Fire Guard, or Fire Guard Tile on Armstrong Accessible Tile System have been approved for the following time-design ratings from Underwriters' Laboratories, Inc.

G033

3½" concrete on ribbed or corrugated deck.
Ceiling Materials:
¾" Travertone Fire Guard
¾" Pensacola Travertone Fire Guard
¾" Fire Guard
12" x 12"
12" x 36"
24" x 24"
(on 1½" ATS Main Runner).

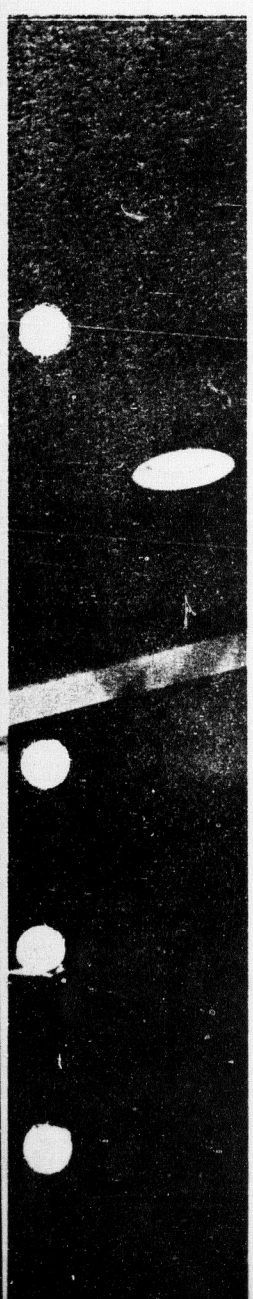
G031

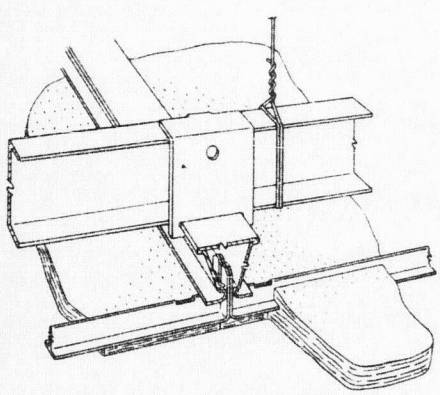
2½" concrete on metal lath.
Ceiling Materials:
¾" Travertone Fire Guard
¾" Pensacola Travertone Fire Guard
⅝" Fire Guard
12" x 12"
12" x 36"
24" x 24"
(on 1½" ATS Main Runner).

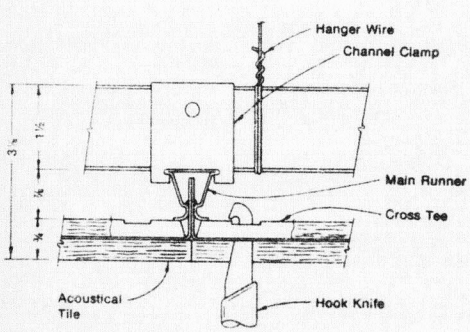
Acce... System

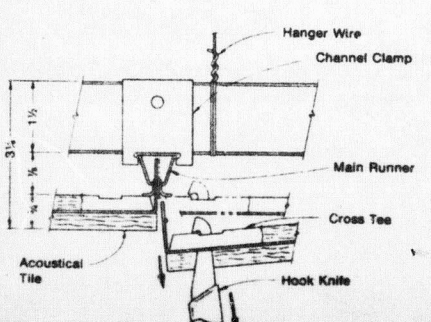
117 a

guide specification









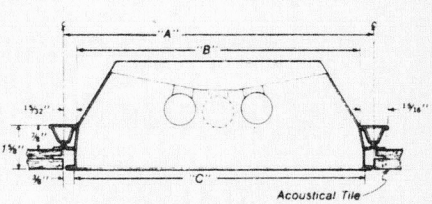
1. SCOPE

1.1 The ceiling shall be Armstrong Accessible Tile System (ATS). The ceiling system shall be acoustical ceiling tile suspended by means of special concealed accessible suspension system.

1.2 The ceiling shall provide concealment for all services in the plenum without impairment of any function.

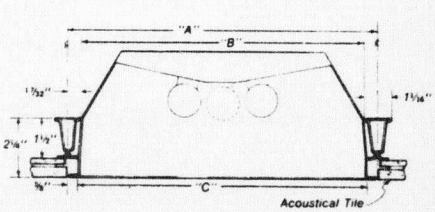
1.3 The ceiling system shall provide accessibility anywhere in the ceiling by inserting a special ATS hooked tool between any two tiles into a slot at the end of the cross member and disengaging cross member from main member.

1.4 The ceiling system shall integrate commercial recessed troffers having the following dimensions:



ATS 7/8" MAIN RUNNER

FIXTURE WIDTH	"A"	"B"	"C"
12" (Nom)	12"	11 1/16"	11¼"
24" (Nom)	24"	23 1/16"	23¼"
36" (Nom)	36"	35 1/16"	35¼"



ATS 1½" MAIN RUNNER

FIXTURE WIDTH	"A"	"B"	"C"
12" (Nom)	12"	10 5/16"	11¼"
24" (Nom)	24"	22 5/16"	23¼"

guide specification (cont.)

1.5 The ceiling system shall provide detachable support for space dividers and shall absorb horizontal loads up to 60 lb/linear foot at line of attachment.

2. SUSPENSION

2.1 The suspension system shall be special ATS framing.

2.2 Main members shall comprise parallel opposing spring-actuated blades which shall be outwardly flared both upward and downward.

2.3 Cross members shall be splined on each side for engagement with kerfed acoustical tile and shall be provided with two vertical holding tongues at each end for retractable engagement with main members. Holding tongues shall have locking dimples which shall snap into upper flared section of main members when fully inserted thereinto.

2.4 Cross members shall have slots in the top of the fin at each end for inserting hooked access tool (hooked "knife").

2.5 Main members shall be .025" (25-gauge) galvanized steel, 12' long x 1½" high; and .023" (24-gauge) galvanized steel, 12' long x ⅞" high.

2.6 Hanger wire shall be 12-gauge galvanized, soft annealed steel.

2.7 Cross members shall be .025" (25-gauge) galvanized steel (12")(24") long; and .034" (22-gauge) galvanized steel 36" long.

2.8 Wall molding shall be either channel or angle type, .020" (27-gauge) galvanized steel and finished on exposed surfaces with off-white enamel.

2.9 Framing shall comply with ASTM C635 Metal Suspension System for Acoustical Tile and Lay-in Panel Ceilings.

3. NOISE CONTROL

3.1 Acoustical tile shall be mineral fiberboard (Type III, Federal Specification SS-S-118A) with ( ) design.

3.2 Acoustical tile shall be (12" x 12") (12" x 24") (12" x 36") and shall be kerfed on all edges.

3.3 Acoustical tile shall have a noise-reduction coefficient (NRC) in the range ( ) according to ASTM C423 Sound Absorption of Acoustical Materials in Reverberation Rooms, as substantiated by independent laboratory test.

3.4 The sound-transmission class (STC) of the ceiling system shall be in the range (35–39) (40–44) (45–49), according to AMA 1-II Ceiling Sound Transmission Test by Two-Room Method.

3.5 Acoustical tile shall have a washable matte white finish with light reflectance of LR (1) (2) (3) according to Federal Specification SS-S-118A.

4. FIRE PROTECTION

4.1 Acoustical tile shall have Flame Spread Rating of Class 25, according to Federal Specification SS-S-118A, as substantiated by independent laboratory test.

4.2 The ceiling system shall comprise Fire Guard fire-resistant tile and shall constitute part of the following fire-rated assemblies, as classified by Underwriters' Laboratories, Inc.:
Floor-Ceiling Assembly Design No. G031
Floor-Ceiling Assembly Design No. G033

5. INSTALLATION

5.1 The suspension system shall be installed according to ASTM C636 Installation of Metal Suspension System for Acoustical Tile and Lay-in Panels.

5.2 The suspension system shall be installed according to the general recommended procedures of Ceiling and Interior Systems Contractors Association (CISCA).

5.3 (Optional procedures for 1½" main members.)

5.3.1 1½-inch carrying channels shall be installed not more than 7 ft on centers and not more than 10 in. from the wall, and shall be supported by hanger wires not more than 4 ft on centers. Main members shall be clamped to carrying channels by ATS Channel Clamps nominally (2)(3) ft on centers.

5.3.2 1½-inch carrying channels shall be installed not more than 12 ft on center and not more than 10 in. from the wall, and shall be supported by hanger wires not more than 4 ft on centers. Main members shall be clamped to carrying channels by ATS channel clamps nominally (2)(3) ft on centers, and shall be supported also by hanger wires midway between carrying channels.

5.3.3 Main members shall be installed nominally (2)(3) ft on centers and shall be supported directly from the structure above by hanger wires no more than 7 ft on centers.

5.4 (Optional procedures for ⅞" main members.)

5.4.1 1½-inch carrying channels shall be installed not more than 5 ft on centers and not more than 10 in. from the wall, and shall be supported by hanger wires not more than 4 ft on centers. Main members shall be clamped to carrying channels by ATS Channel Clamps nominally (2)(3) ft on centers.

5.4.2 1½-inch carrying channels shall be installed not more than 12 ft on centers and not more than 10 in. from the wall, and shall be supported by hanger wires not more than 4 ft on centers. Main members shall be clamped to carrying channels by ATS Channel Clamps nominally (2)(3) ft on centers, and shall be supported also by hanger wires not more than 4 ft on centers.

5.4.3 Main members shall be installed nominally (2)(3) ft on centers and shall be supported directly from the structure above by hanger wires not more than 5 ft on centers.

5.5 Hangers shall be (cast-in-place hanger wires) (percussion hanger inserts) (other).

5.6 (Optional) ATS Stabilizer Bars shall be installed at each hanger wire except at those supporting recessed troffers.

5.7 Levelling splines shall be installed between 12" x 12" tiles supported by either 24" or 36" cross members. All splines shall be installed between 24" x 24" tiles.

5.8 Border tiles shall be at least 6" wide and shall be installed with spring steel spacers at wall molding.

5.9 Lighting fixtures shall be installed according to reflected ceiling plans and shall be wired to junction boxes according to National Electrical Code. Recessed troffers shall have hanger wires at each corner.

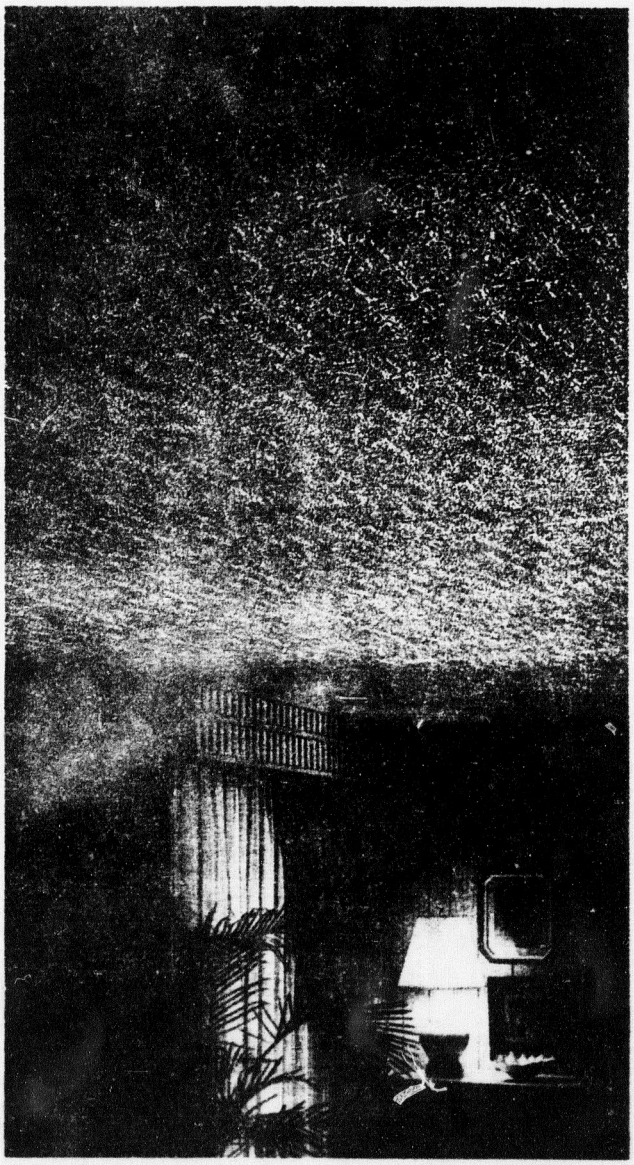
5.10 Acoustical panels shall be installed according to manufacturer's recommendations.

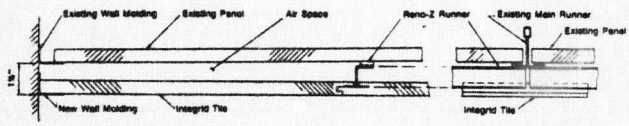
Reno-Z Ceiling System

Reno-Z is a remodeling system that provides a fast, economical method of refurbishing an existing suspended ceiling. With Reno-Z there's no need to remove the existing ceiling panels. Ends of the Reno-Z tee slip over the flanges of the existing main runners, and 12" x 48" Integrid panel tiles are inserted.

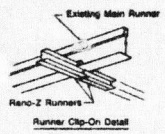
Key to the Reno-Z System is the special-designed Z runner. Its special end detail fits the flange of the existing main runner, enabling the Z itself to fall under the old ceiling. The flange of the runner accepts the kerf of the special Integrid ceiling tile—and the tiles have interlocking tongue-and-groove details, presenting an almost monolithic appearance to the ceiling. Seams are practically unnoticeable. The grid is concealed—no metal is visible.

Light fixtures pose no problem. 1½" U channels are clipped on the bottom of the grid supporting the fixtures. The Integrid panel tiles will fit right in the U section of the channel, giving the fixture a neat, regressed finished appearance.

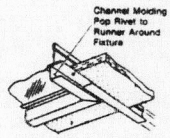




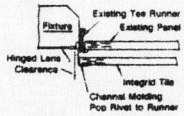
Cross Section of Ceiling



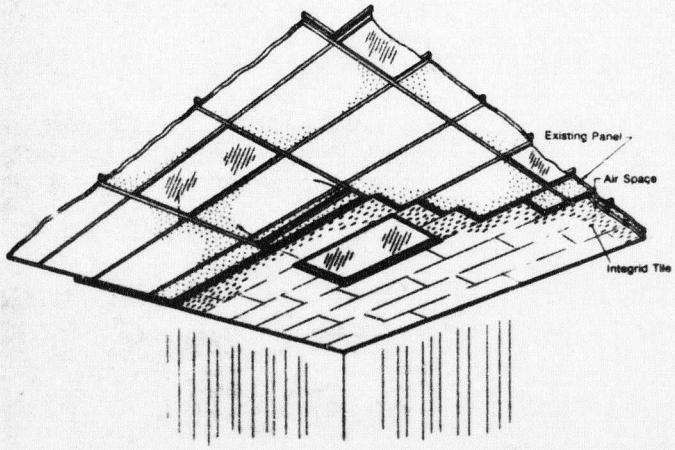
Runner Clip-On Detail



Perspective Cutaway Thru Fixture



Section Thru Fixture



Reno-Z Ceiling Installation

Integrid Ceiling Systems

Armstrong

Armstrong Integrid Ceiling Systems offer several methods of achieving a beautiful monolithic ceiling quickly and at modest cost in both new construction and remodeling work.

The Integrid Direct Hung System, shown below, utilizes the same basic components as other suspended systems—wall molding, main runner, and cross tee. The difference is in the design of cross tee and main runner.

The Integrid runner is open at the bottom and has a spring action designed to accept a special slit detail on the cross tee. This provides for fast installation, at low cost.

The large Integrid panel tiles are 12" x 48", are kerfed to the tees, and have T&G end details that interlock adjacent tiles. This presents a monolithic look with the suspension system completely concealed.

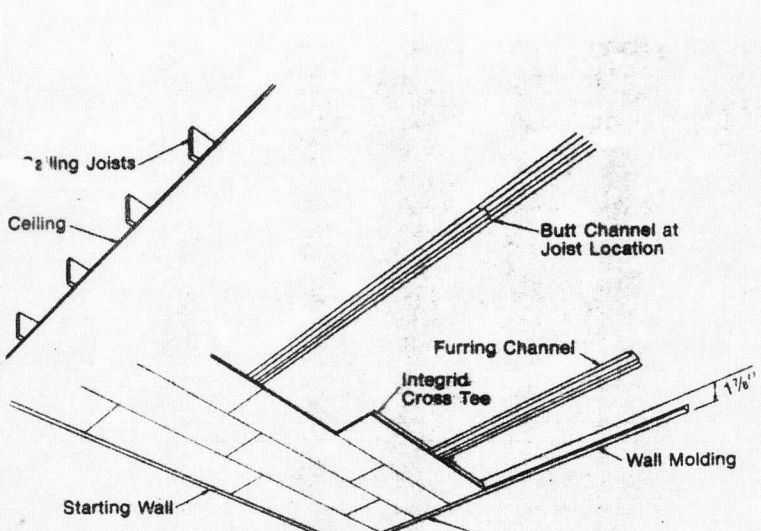
The Integrid Furring Channel System, shown below, allows installation of the ceiling directly to the underside of exposed wood joists, or to plaster or other finishes over wood joist construction.

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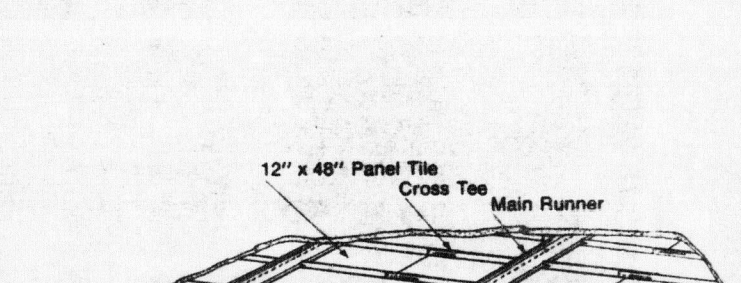
ceiling. Furring channels are run at right angles to the joists and nailed to them. Cross tees snap into the furring channels and fit the kerfed edges of 12" x 12" or 12" x 48" tile. Tongue-and-groove ends lock tile firmly together.

The Integrid System allows use of either recessed or surface-mounted lighting. Special Integrid light fixtures, 1' x 4' (2-lamp) and 2' x 4' ([illegible]-lamp), are available.





Integrid Furring Channel



Direct Hung System

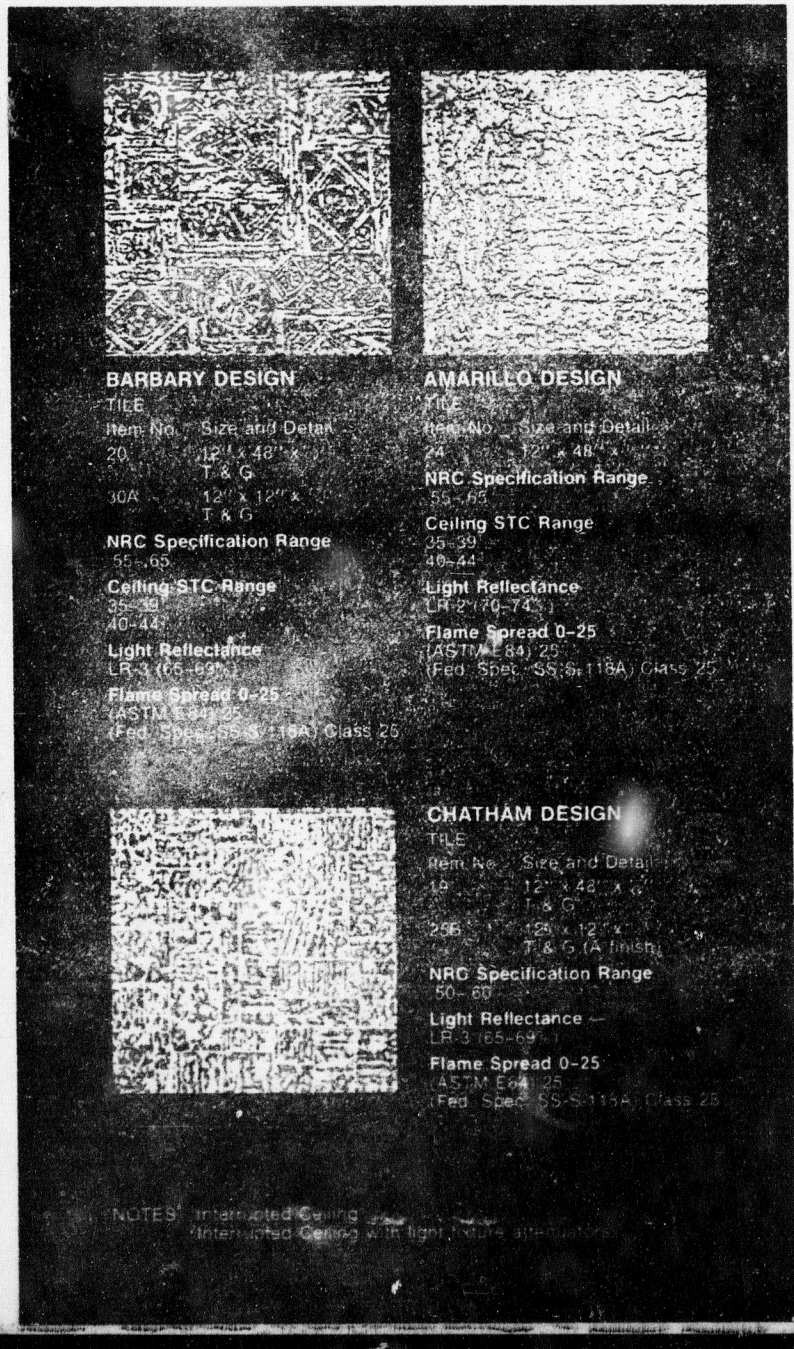
Reno-Z.
Integrid Ceiling Systems

product data

These two versatile ceiling systems utilize the same 12" x 48" panel tile. Available in the three designs shown below, these panel tiles provide efficient acoustical control and fire safety.

Integrid Ceiling System

guide specifications



Integrid System

1. MATERIALS

1.1 Ceiling panels shall be Armstrong Cork Company:

(1) Integrid, Chatham Design, 12" x 48" x ½", Item No. 19
(2) Integrid, Barbary Design, 12" x 48" x ½", Item No. 20
(3) Integrid Amarillo Design, 12" x 48" x ½", Item No. 24

1.2 Suspension system shall be Armstrong Cork Company Concealed Integrid System. The main runner shall be .0134"-thick galvanized steel, Item 5200. The cross tees shall be .025"-thick galvanized steel, Item 5210.

2. INSTALLATION

2.1 Spaces shall be cleaned and free of all litter prior to installation of ceiling.

2.2 Suspension system shall be the type specified in 1.2 and shall be installed to conform to ASTM C635-69.

2.3 Ceiling panels shall be of the design and sizes specified and shall be installed as designated on the plans and in accordance with manufacturer's recommended procedures.

2.4 Completed installation shall be inspected for defects. All soiled surfaces shall be cleaned and defective components replaced.

3. NOISE CONTROL

The Noise-Reduction Coefficient of the ceiling panels shall fall within the range .45–.65 according to ASTM C423 as substantiated by independent laboratory test.

4. FIRE PROTECTION

Ceiling panels shall have Flame-Spread Rating of 25 or less according to ASTM E84 as substantiated by independent laboratory test.

Miscellaneous Products

Cushiontone

(wood fiber)

Armstrong

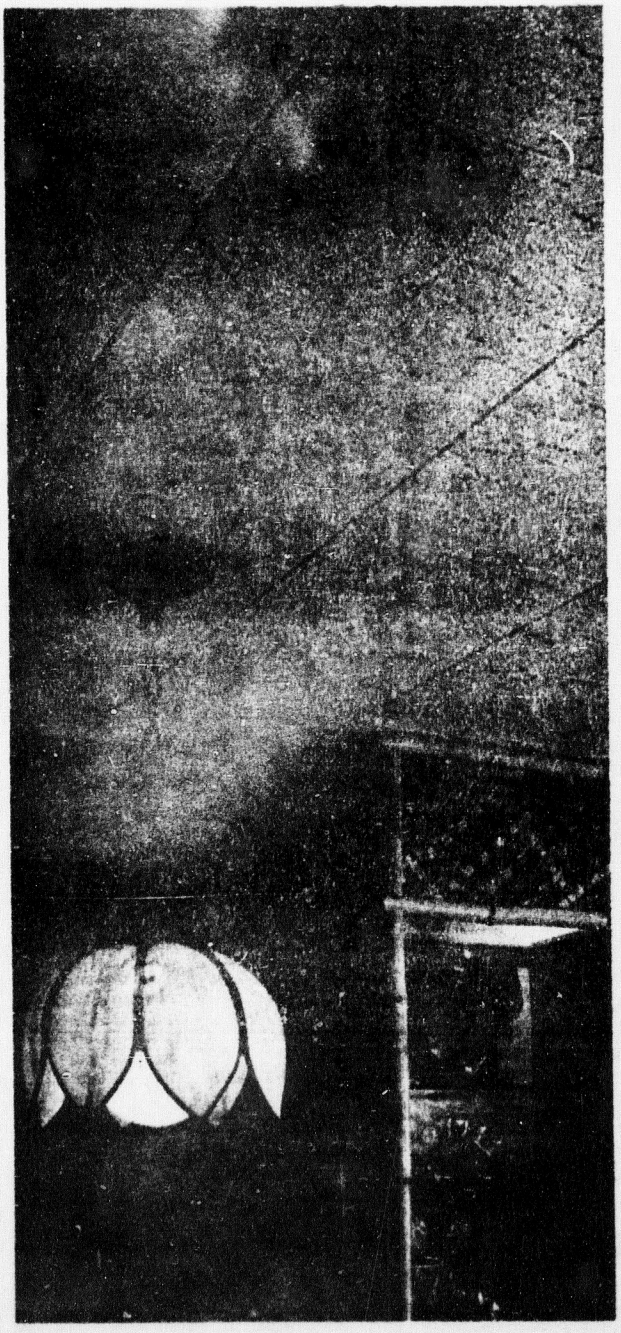
Armstrong Cushiontone Ceilings are of wood fiber composition, available in tile and lay-in panel form.

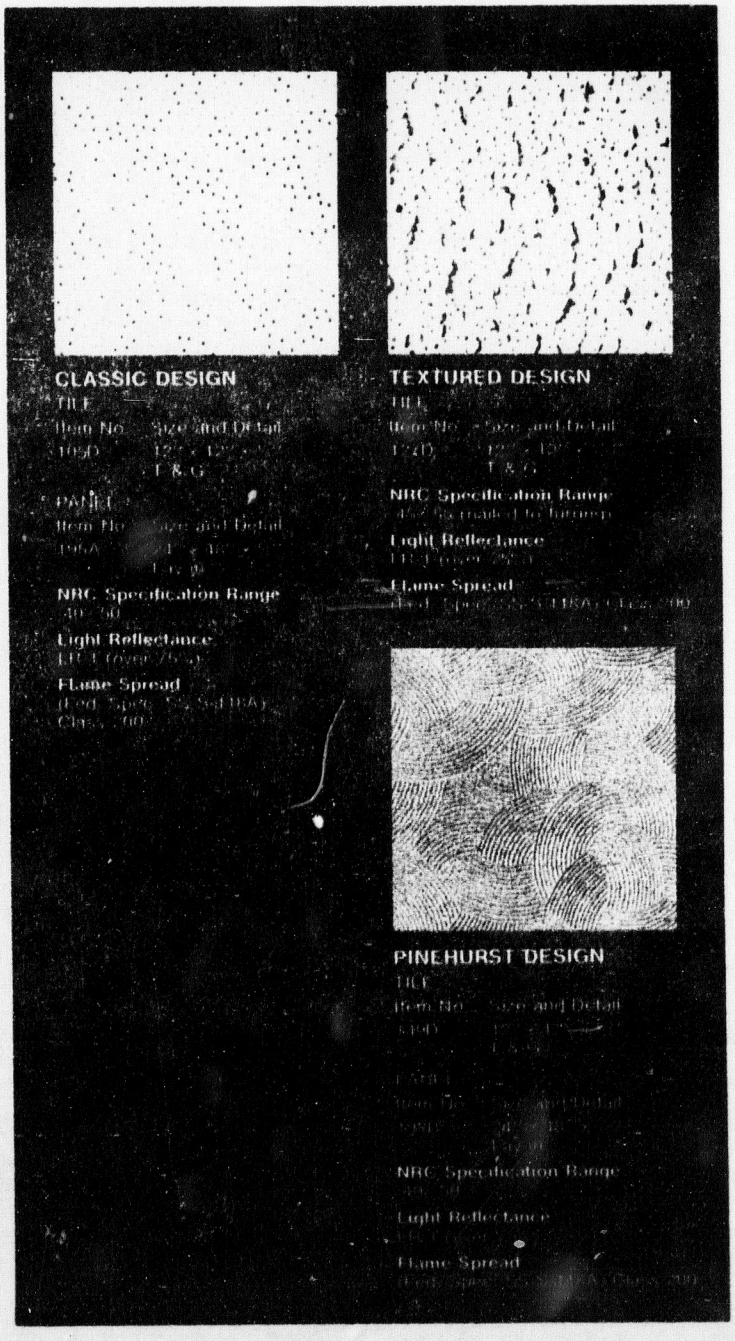
Insulation Value—Average C factor (at 75 F) is .70 (3/16" thickness), .75 (½" thickness).

Surface Finish—Factory-applied, washable, white vinyl latex paint finish. Painted beveled edges.

Self-Leveling Tongue-and-Groove Joints--Interlocking tongue-and-groove tile edges assure a level appearance.

Installation—various concealed and semi-exposed grid suspension systems (tile). Cemented to any smooth, hard surface or cemented and stapled to plaster or gypsum board. Nailed or screwed (T & G can be stapled) to wood furring strips. Applied to suspended gypsum board by screw application. Exposed grid suspension system (lay-in).





CLASSIC DESIGN

TILE

Item No. Size and Detail

105D 12" x 12" x 5/16" T & G

PANEL

Item No. Size and Detail

105A 4' x 8' x 5/16" T & G

NRC Specification Range

.40-.50

Light Reflectance

LR 1 (over 75%)

Flame Spread

(Fed. Spec. SS-S-118A) Class A (0-25)

TEXTURED DESIGN

TILE

Item No. Size and Detail

124D 12" x 12" x 5/16" T & G

NRC Specification Range

.40-.50 (varies with furring)

Light Reflectance

LR 1 (over 75%)

Flame Spread

(Fed. Spec. SS-S-118A) Class A (0-25)

PINEHURST DESIGN

TILE

Item No. Size and Detail

130D 12" x 12" x 5/16" T & G

PANEL

Item No. Size and Detail

130A 4' x 8' x 5/16" T & G

NRC Specification Range

.40-.50

Light Reflectance

LR 1 (over 75%)

Flame Spread

(Fed. Spec. SS-S-118A) Class A (0-25)

Spacetone

Spacetone units are made of an open-cell glass material and provide acoustical control in areas where usual sound-absorbing materials are not suitable. They also provide additional acoustical control in areas where sound conditioning is particularly critical.

Physical Properties—Spacetone units are inorganic, noncombustible, dimensionally stable, and unaffected by moisture. There is no internal binder, so units cannot delaminate.

Painting—Units are supplied in white only. They can be painted any color by spray or roller application.

Size—Spacetone units are 11½" x 16" x 1 15/16" and weigh approximately 2 lb.

Noncombustible—Rated Class 25 (noncombustible) under Flame-Spread Index section of Fed. Spec. SS-S-118A.

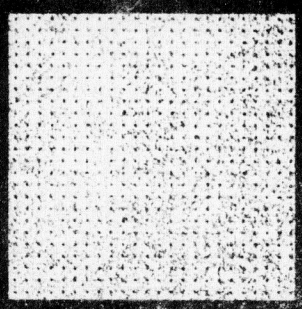
NRC Specification Range—Mechanically suspended—.60–.70 (1" blanket). Nailed to furring—.70–.80 (2" blanket).

Light Reflectance—LR-1 (over 75%).

Surface Finish—Factory-applied acrylic white paint finish.

Installation—Nailed or screwed to wood furring strips or mechanically suspended in exposed grid system.

Repainting—Asbestos Board units may be repainted with flat or semigloss latex coatings. Oil-base paints should not be used. When repainting unperforated panels, both sides must be coated to avoid warpage.



SPACETONE

Item No. Size and Detail
801 11½" x 16" x 1"
Open-Cell Glass

Sound-Absorption Coefficients of Armstrong Spacetone Units (sabins per unit)

Frequencies (cps)	Absorption in sabins			
	32" OC patch	24" OC patch	16" OC strip	16" OC patch
125	0.2	0.8	0.2	0.2
250	0.6	0.7	0.2	0.8
500	2.2	2.0	2.0	1.6
1,000	2.4	2.2	2.2	1.6
2,000	2.1	2.0	1.8	1.5
4,000	1.7	1.7	1.7	1.3

These figures will vary slightly with spacing and placement, but in nearly all applications an average figure of 2 sabins will be realized. For more uniform absorption with less absorption at higher frequencies place units 16" on centers in patches to achieve figures in right column (patch).

NOTE: As measured by Riverbank Acoustical Laboratories, Geneva, Illinois, in accordance with ASTM designation C423-66, Tentative Method of Test for Sound Absorption of Acoustical Materials in Reverberation Rooms.

Spacetone Estimating Guide

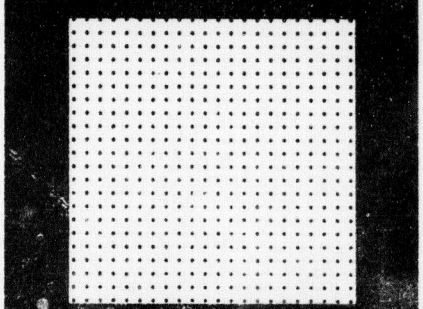
Approximate number of units required in rooms of normal volume, occupancy, and finish detail:

Type Room	** No. of Units or % of Room Volume*
School Classrooms	50–75 Units
Choral Room With Ac. Ceiling	¾%
Choral Room Without Ac. Ceiling	1%
Band Room With Ac. Ceiling	1%
Band Room Without Ac. Ceiling	
Under 35,000 cu ft	2%
Over 35,000 cu ft	1½%
Lecture Room	1%
Conference Room	1%
Gymnasium	1%
Multipurpose Room	1%
Swimming Pools	1%
Courtroom	1%
Committee Room	1%
Study Room	1%–1½%
Libraries	1%–1½%
Lobbies, Vestibules	1%–1½%
Dining Rooms	1%–1½%
Restaurants, Lounges, Cafeterias	1%–1½%
Offices, Stores, Banks	1%–1½%
Theaters, Auditoriums, Churches	½% to 1%
Broadcast, Recording Studios	1½% to 2%

*NOTE:
Variations, where indicated, are for room volume, furnishings, and acoustical preference. Smaller rooms generally require larger percentage and larger rooms vice versa.

Example:
Room Length = 30′
Room Width = 20′
Room Height = 10′
6,000 cu ft

6,000 × 1% = 60 Spacetone units



PERFORATED ASBESTOS BOARD PANEL

Item No.	Size and Detail
A-402	24" x 24" x Beveled
A-403	24" x 24" x Unbeveled
A-404	24" x 48" x Beveled
A-406	24" x 48" x Unbeveled
A-420	23" x 23" x Unbeveled
A-421	23" x 47" x Unbeveled
A-415	23" x 59" x Unbeveled

installation precautions

Armstrong

Acoustical ceilings that are unsatisfactory in appearance are usually the result of poor application or disregard of the manufacturer's instructions. Here are a few recommendations to consider when designing and specifying an Armstrong ceiling in a building.

Storage of Material at Job Site—Before Armstrong ceiling materials are installed, the units (panels or tile) should be permitted to reach room temperature and have a stabilized moisture content. They should not, however, be installed in spaces where the temperature or humidity conditions vary greatly from the temperatures and conditions that will be normal in the occupied space. (Exception: Armstrong Ceramaguard)

Temperatures and Humidities During Installation—Acoustical materials are interior finish products and are designed for installation within the normal expected occupancy range of 60 to 85 F. Relative humidity should be no more than 70%. All plastering, concrete, terrazzo, or any other wet work should be complete and dry. All windows and doors should be in place. The heating, ventilating, and air-conditioning systems should be installed and operable where necessary to maintain proper temperatures before, during, and after installation of the acoustical materials.

Cement Installation—The temperature of the tile cement and the surface to which the tile is cemented may cause cement failure. Do not cement acoustical tile when the room temperature exceeds 100 F or when the room or cement temperature is below 50 F. Application to damp plaster or in a damp room may cause dimensional changes in the tile and failure in the adhesive. Tile cemented to a painted surface will fail if the paint is loose or peeling.

Where Not to Install—Some Armstrong ceiling materials are more abuse-resistant than others. It is not good practice to locate acoustical ceiling tile or panels on low wall or ceiling surfaces where they might be damaged. Instead, the use of impact-resistant products such as Armstrong Armatuff or Armashield should be considered for these applications.

Thermal Insulation—Most Armstrong acoustical ceiling materials are good thermal insulators. Under conditions of moderate temperature and humidity, most will provide adequate thermal insulation without need for supplemental insulation. However, their effect upon heat loss should be considered in combination with the entire assembly.

In relatively cold climates where the problem is one of preventing condensation on the underside of cold roof surfaces, it is considered the best practice to locate vapor-sealed insulation on top of the roof slab with the acoustical ceiling material installed in the conventional manner in the room below. If this cannot be done, thermal insulation (batts and blankets) can be installed in the plenum above the suspended ceiling if not a fire-rated ceiling. A vapor barrier could be placed between the thermal insulation and ceiling panels, although it is difficult to provide an effective vapor seal by this method.

It should be noted that placing thermal insulation directly on the suspension system or on the back of the acoustical ceiling panels could interfere with plenum accessibility, depending on the method of installation. If thermal insulation has to be installed above a suspended ceiling, adequate ventilation should be provided in the plenum to prevent high humidity conditions. Failure to provide ventilation could lead to condensation and subsequent damage to the ceiling panels.

Under no circumstances should thermal insulation be installed on the back of panels in a fire-rated ceiling unless so designated in the specific fire-resistance design assigned to the structure.

Selecting Lighting—When selecting any type of lighting, it is always advisable to consider the effect it will have on the appearance of an acoustical ceiling.

The most functional of all types of lighting is the flush, recessed fixture commonly used with suspended acoustical ceilings. Besides providing excellent illumination, this type of installation eliminates the shadow problems of side lighting and complements the appearance of an acoustical ceiling.

Fixtures located close to the underside of the ceiling, such as cove lighting, are generally unsatisfactory. In such cases, light grazes across the ceiling and emphasizes variations as small as .005 of an inch.

Window-wall lighting and semi-recessed fixtures often create the same uneven ceiling effect. Yet both can be used with acoustical ceilings if grazing side light is eliminated. With window-wall lighting, this can be done with a valance, draperies, or venetian blinds. Shielding around the outside of semi-recessed fixtures accomplishes the same purpose.

Surface-mounted fixtures can also be troublesome in causing ceiling shadows. However, this type of fixture can be shielded to prevent low-angle glaring light from grazing across the ceiling.

If shadow-casting light cannot be avoided, make sure that the unfavorable light condition exists while the ceiling is erected so that workmen are aware of this condition and can give special attention to the ceiling joints.

Armstrong Ceiling Systems require no

repainting and maintenance recommendations

125 a

more maintenance than painted ceilings. However, when maintenance is necessary, certain procedures should be followed to insure continued high performance and attractive appearance.

Cleaning—Dust and loose dirt may easily be removed by brushing or with a vacuum cleaner. Vacuum cleaner attachments such as those designed for cleaning upholstery or walls do the best job. Be certain to clean in one direction only. This will prevent rubbing dust into the surface.

After loose dust has been removed, pencil marks, smudges, or clinging dirt may be erased easily with an ordinary art gum eraser. However, a good grade wall cleaner may be preferred. Be certain to use fresh cleaner. An alternative method of cleaning is with a moist cloth or a sponge dampened in water containing mild soap. The sponge should contain as little water as possible. After washing, the soapy film should be wiped off with a cloth or sponge slightly dampened in clean water. Ceramaguard Ceilings and Mylar-faced ceilings are unaffected by moisture and will withstand repeated washings with mild detergents or germicidal cleaners.

Repainting—All Armstrong Ceiling Systems can be repainted by spraying, brushing, or roll coating without appreciable loss of acoustical efficiency.

Spraying is the preferred method since it is more economical and will cover embossed or irregular surfaces better than roll coating or brushing. Roll coating is very acceptable for flat, smooth-surfaced panels. For best results, panels should be removed from the grid suspension, laid flat for painting, and allowed to dry thoroughly while still flat before being reinstalled. This method eliminates the costly operations of masking walls and covering furniture. It also provides for easier cleaning and/or repainting of the grid while the panels are out being repainted.

Type of Paint—Regardless of the method of paint application employed, a good grade of paint from a reputable manufacturer should be used. An example of a recommended paint type for each general class of ceiling material is listed as follows:

Travertone Minatone Minaboard Temlok Cushiontone Ceramaguard	PPG 80-6 Wallhide Latex Flat Wall Paint

Corkstyle—Pratt and Lambert Vapex #6138

Armashield—Felton-Sibley Alkyd Flat Wall Paint

Vinyl- or plastic-coated tile—PPG 88-6 Satinhide Lo-Lustre Latex Enamel for Gloss Finish or PPG 80-6 for Flat Finish

Mylar—Dutch Boy Nalplex 72-11

Where paint matching is required or colors desired, obtain paint from stores which tint their own paints.

Spray Painting—First remove loose dust from the material with a brush or vacuum cleaner attachment. Thin the paint only as much as necessary. If it is too thick for proper spraying, care should be taken that it is thinned only with the solvent recommended by the manufacturer. When spray painting, apply the paint with a stream directed perpendicularly to the surface of the material, moving the gun back and forth to get a uniform coating. Under normal conditions, one coat should be sufficient.

To assure a good job, it is wise to select the best spray equipment available. Without proper equipment, even extreme care and full precautions cannot insure a beautiful finish.

Brush Painting—First remove loose dirt from the material with a brush or vacuum cleaner. Then, if necessary, thin the paint to such a consistency that it will not close the perforations or fissures in the material.

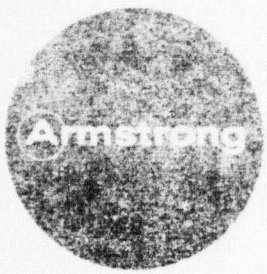
Wet the brush thoroughly with the paint. Wipe excess paint from the outside of the brush, then apply it to all four bevels of the unit first. Touch the surface of the material at several points to distribute the paint evenly and brush out this paint to a uniform coating.

Roll Coating—The main advantage of roll coating is its speed of application. Even though the applicator must brush paint all bevels after roll coating, this method is faster—in general—than either the brush or spray method.

Painting Precaution

When painting acoustical materials, the painter should be very careful that he does not close up the perforations or fissures in the material. It is through these openings in the surface that sound waves enter the body of the acoustical material and are absorbed. In all ventilating ceilings, tiny perforations extending through the material serve as a means through which conditioned air is introduced into the room below. Care should be taken that these perforations are not clogged. Following the simple instructions above will help the painter to preserve the sound-absorbing properties and/or ventilating functions of the material.

Armstrong Cork Company cannot guarantee that published flame-spread values for ceiling products will remain the same after repainting. The variations which are possible in field paint applications could affect the flame-spread index.



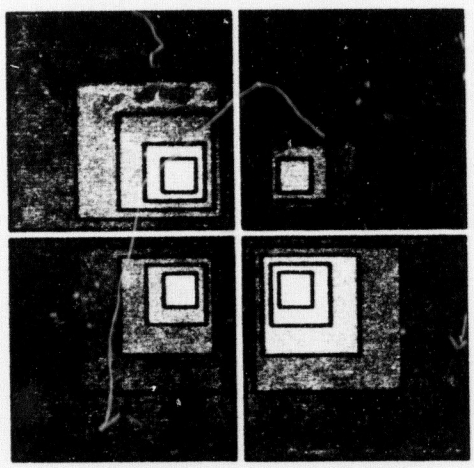
JACOBSON & CO.
1079 East Grand St.
Elizabeth, New Jersey 07201

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9.1/CeL

127 a

THE CELOTEX CORPORATION 9 ACOUSTICAL TREATMENT
January 1976



1976 Celotex Acoustical Systems

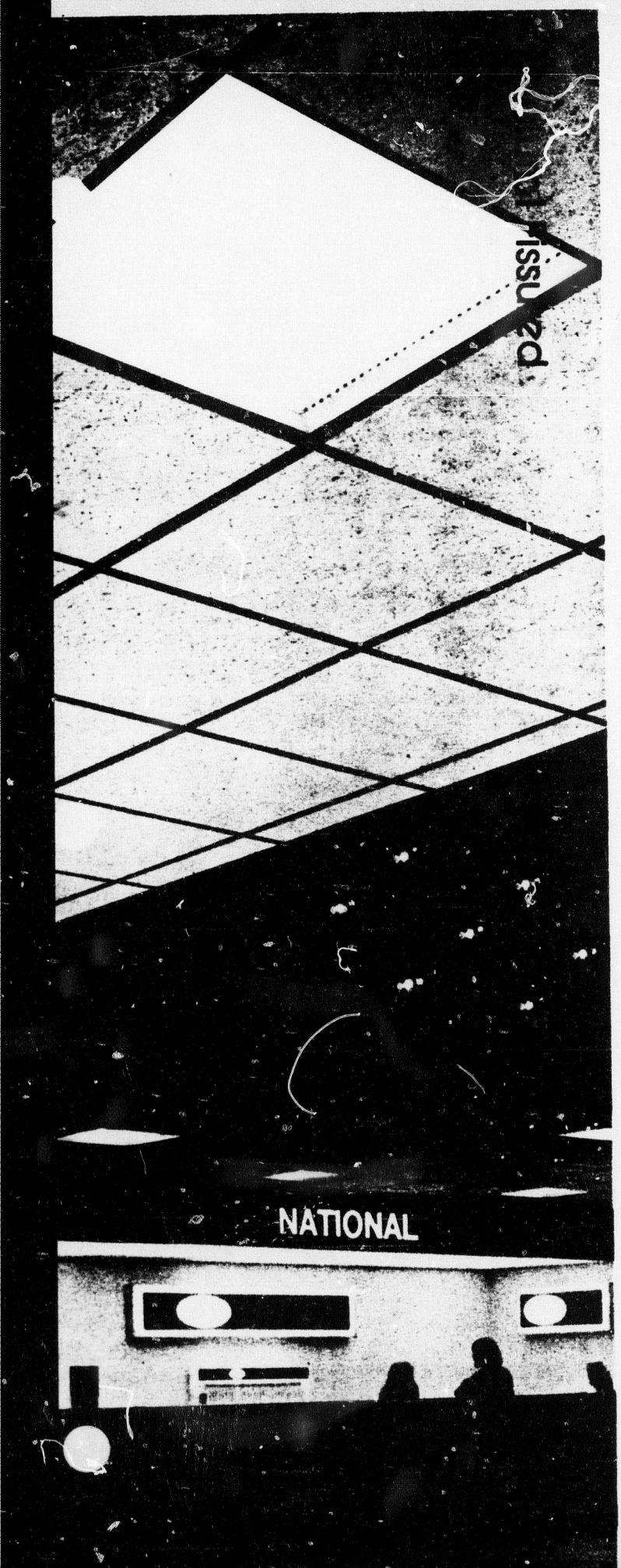
THE CELOTEX CORPORATION 9 ACOUSTICAL TREATMENT
January 1976

Celotex®
BUILDING PRODUCTS

Texture-Tone

129 a 9.1/CeL

Celotex



1976 Celotex® Acoustical Systems

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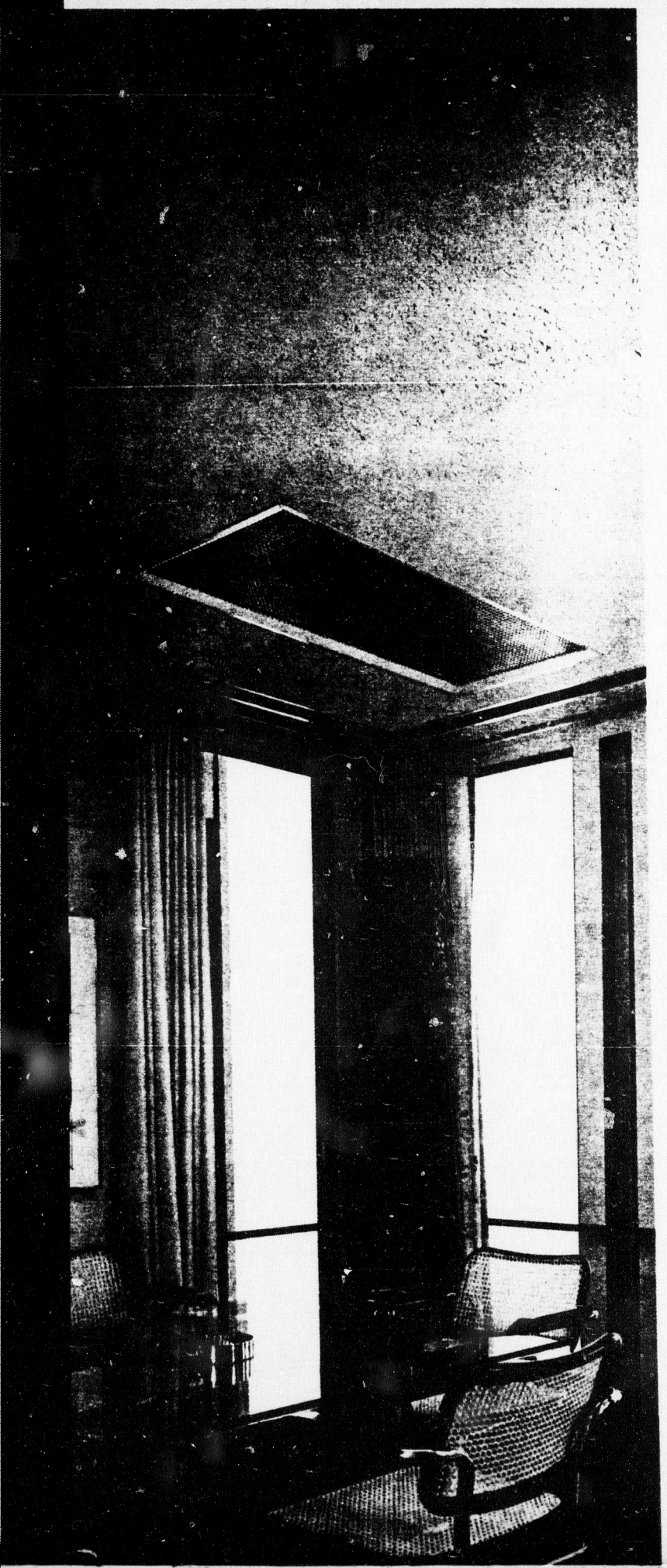
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Characteristics, properties or performance of materials or systems described herein are based on data obtained under controlled test conditions. Celotex offers no warranties, expressed or implied, as to their characteristics, properties or performance under any variations from such conditions in actual construction. The Celotex Corporation assumes no responsibility for effects of structural movement.

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*Trademark



Celotone® Mineral Fiber Acoustical Tile and Lay-In Panels

Celotex® Celotone Acoustical Ceilings offer a broad selection of beautiful textures due to their specially molded mineral fiber process. Textures range from light to bold natural fissuring.

The Reveal Edge feature, especially pronounced in the Le Baron panels, produces pattern highlights, provides recess of the suspension system, or the panels may be installed on a black or colored grid for additional pattern emphasis.

The nondirectional concept is a pattern of all-over texturing producing a distinctive monolithic effect in the installed ceiling.

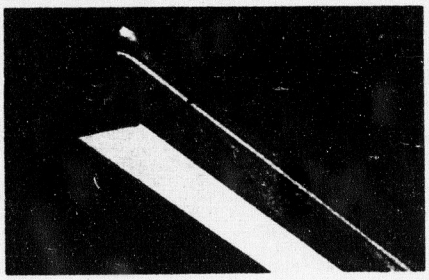
Foil-Back products add significant improvements to the sound attenuation value (room-to-room thru plenum sound transmission rating). Foil-Back construction is winning increasing architectural/owner acceptance for the benefits it provides. The installed ceiling gives an office the acoustical properties for true office privacy.

Design tile, a face-fabricated form of Celotone tile, expresses elegance, with bold etched and fissured surfaces, and block shapes in high relief. This tile for the uncommon interior – the office or reception area that is designed to be away-from-the usual.

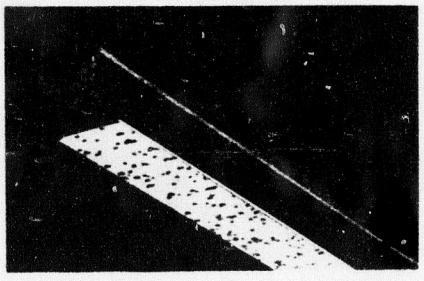
Years of experience and an impressive record of successful installations make Celotone products a No. 1 consideration for memorable ceilings in finer offices, hotels, restaurants and public buildings.



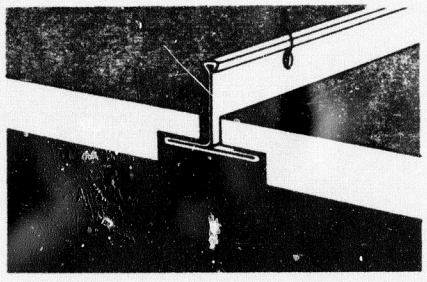
Celo-Loc Suspension Components



Lo-gloss textured white



Lo-fissured white



LeBaron, Texture-Tone, N-D Texture-Tone and Natural Fissured are also available with Reveal Edge fabrication for recessed grid decorative accent.

...with the elegant look of textured reveal edge tile
...plus the installation advantages of a lay-in panel

Much more than a ceiling panel, Le Baron actually embodies an advanced ceiling system – complete even to its own specially designed Celo-Loc* grid. A truly exceptional ceiling... with all the appearance of deeply textured tile – at the same time offering the ease of installation, the total accessibility features of lay-in panel suspended ceilings.

Reveal edges and 1" wide cross-grooves are design highlights. The reveal edge fabrication of the panels provides recess of grid members. *The cross grooves give each 24" x 24" panel the appearance of four 12" x 12" reveal edge tile units.*

In the completed installation, the total Le Baron ceiling expresses breath-taking luxury.

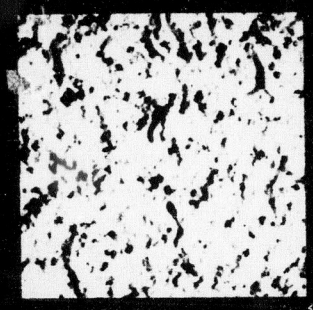
Grid members, comprising the Celo-Loc Suspension System, are available in these exclusive finishes that complement and enhance... a lo-gloss textured white... or lo-fissured white, simulating the cross-grooves of the panels, for monolithic ceiling effect.

Le Baron. Another great Celotone acoustical product. Perfect for executive offices, conference rooms, reception areas – wherever there is a special interior that demands to be different, to be set apart.

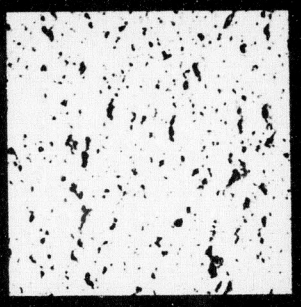
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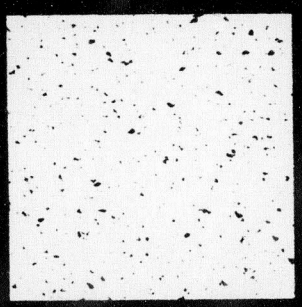




CELOTONE
N-D TEXTURE-TONE TILE



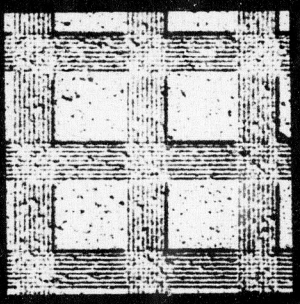
CELOTONE
NATURAL FISSURED TILE



CELOTONE
CHASE TILE



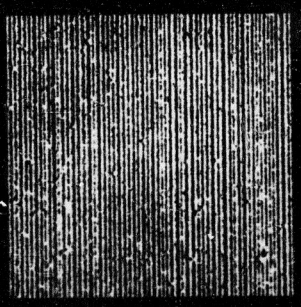
CELOTONE
TEXTURE-TONE TILE



CELOTONE
PLAID DESIGN TILE



CELOTONE
RIVIERA DESIGN TILE



CELOTONE
STRIATED DESIGN TILE

Technical Data Mineral Fiber Tile

CELOTONE® TILE Technical Data, Including Sound Absorption Coefficients

Protectone® Tile and Panels	Natural Fissured	¾"	12" × 12"	7	47	49	51	75	86	80	60-70	0.35	1.4	78
	Natural Fissured Foil-Back	¾"	12" × 12"	7	35	41	63	82	85	84	65-75	0.35	1.5	78
	Natural Fissured Foil-Back Reveal Edge	¾"	2'× 2'	7	27	32	67	89	86	91	65-75	0.35	1.4	78
Safetone® Tile† and Panels	Natural Fissured	¾"	12" × 12"	7	50	54	55	77	87	88	65-75	0.35	1.4	78
	Chase	¾"	12" × 12"	7	56	51	53	74	82	87	60-70	0.35	1.5	80
	N-D Texture-Tone	¾"	12" × 12"	7	52	57	55	78	88	92	65-75	0.35	1.3	71
	Texture-Tone	¾"	12" × 12"	7	49	55	53	80	94	83	65-75	0.35	1.3	72
	Texture-Tone Reveal Edge	¾"	2' × 2'	7	43	46	52	75	85	89	60-70	0.35	1.4	72
	N-D Texture-Tone Reveal Edge	¾"	2' × 2'	7	54	51	54	76	84	87	60-70	0.35	1.1	75
	Natural Fissured Foil-Back	¾"	12" × 12"	7	44	41	65	83	85	91	65-75	0.35	1.4	78
	Natural Fissured Foil-Back Reveal Edge	¾"	2'× 2'	7	28	32	66	89	91	97	65-75	0.35	1.4	78
	Texture-Tone Foil-Back	¾"	12" × 12"	7	43	39	63	86	89	96	65-75	0.35	1.3	72
	Texture-Tone Foil-Back Reveal Edge	¾"	2'× 2'	7	28	30	64	91	90	89	65-75	0.35	1.4	72

Safetone Panels†††	Le Baron	¾"	2' × 2'	65-75†††	0.35	1.3	71
Safetone Tile†††	Design Plaid Design Riviera Design Striated	¾"	12" × 12"	65-75†††	0.35	1.1	68

CELOTONE TILE Normalized Attenuation Factors

				125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	
Protectone Tile	Natural Fissured	¾"	12" × 12"	31	37	36	27	27	28	27	28	30	31	34	39	44	46	48	50	30-34
	Natural Fissured Foil-Back	¾"	12" × 12"	32	40	42	34	35	39	40	41	43	45	46	52	54	56	56	55	40-44
	Natural Fissured Foil-Back Reveal Edge	¾"	2'× 2'	28	34	37	31	32	34	36	39	40	39	42	43	44	44	45	46	40-44
Safetone Tile	Chase	¾"	12" × 12"	32	37	36	28	28	29	30	31	33	34	36	42	46	49	53	55	35-39
	Natural Fissured	¾"	12" × 12"	28	34	33	25	24	25	26	27	29	29	31	34	40	43	48	53	30-34
	Natural Fissured Foil-Back	¾"	12" × 12"	31	39	38	31	32	34	37	38	40	42	43	48	51	53	53	52	40-44
	Natural Fissured Foil-Back Reveal Edge	¾"	2'× 2'	25	34	34	29	30	34	35	38	40	39	39	42	44	42	43	44	35-39
	Texture-Tone Foil-Back	¾"	12" × 12"	32	39	38	31	32	35	37	39	39	40	42	46	49	51	52	54	40-44
	Texture-Tone Foil-Back Reveal Edge	¾"	2'× 2'	26	32	34	29	29	32	35	37	38	38	38	40	42	42	42	44	35-39

PROTECTONE UL Time-Rated Floor/Ceiling Assemblies

N-D Texture-Tone Natural Fissured Natural Fissured Foil-Back Chase Texture-Tone Plaid	¾" × 12" × 12"	Kerfed	H & T	Wood deck over wood joists	12-1 hour	L0C1	—	1 hr.	—
			Z-runner H & T	Concrete slab over steel bar joists	77-3 hours	G004	3 hr.	3 hr.	—
			H & T	Concrete slab over steel bar joists — full access	23-2 hours	G003	2 hr.	2 hr.	—
			H & T	Concrete slab over steel bar joists with penetrations	34-2 hours	G005	2 hr.	2 hr.	—
			H & T	Concrete slab over blended deck, steel beams, penetrations	95-2 hours (3 hour beam)	A002	2 hr.	2 hr.	3 hr.
			Concealed T	Lt. wt. concrete steel beams, penetrations	—	D010	3 hr.	3 hr.	4 hr.
N-D Texture-Tone Natural Fissured Natural Fissured Foil-Back Texture-Tone	¾" × 24" × 24" (nominal)	Trimmed or Reveal Edge	Exposed Grid	Concrete slab over steel bar joists penetrations	36-2 hours	G208	2 hr.	2 hr.	—

*Restrained: Floor and roof systems can be considered to be restrained when the surrounding or supporting structure is capable of resisting substantial thermal expansion from the floor or roof system. **Unrestrained: Construction not complying with the above is assumed to be free to rotate and expand. Refer to ASTM E119 Tentative Revision, for comprehensive explanation of concept of restrained and unrestrained construction assemblies.

NOTE: Celotone tile is also available with PlastiGard** finish (scrubbable acrylic overspray).

†Safetone formulation: Class 25 Fed. Spec. SS-S-118a, ASTM E84-Classified by UL for Flame Spread Index 0-25.

NOTE: All other tile listed, in addition to Natural Fissured, available in Protectone formulation.

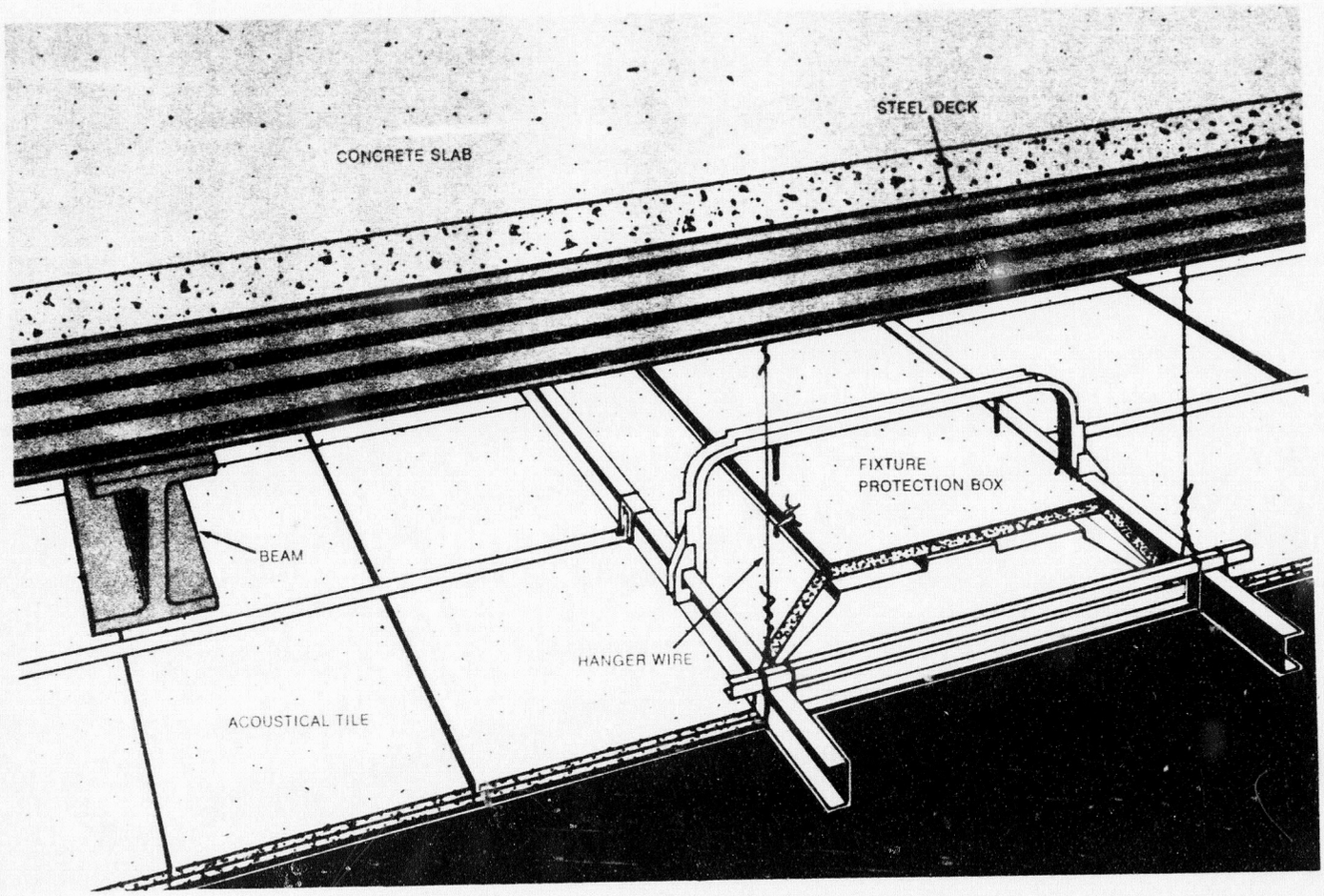
Protectone® and Safetone® mineral fiber products are manufactured under Patent Nos. 3,184,372 or 3,250,633.

**Trademark

†††Jim Walter Research Corp. evaluation.

Technical Data Cont.

CROSS-SECTION, TIME-RATED CONSTRUCTION



Celotone
Architectural Specifications

SCOPE

A. The installation of all acoustical work covered in this section shall be by an approved Celotex acoustical contractor.

B. The acoustical contractor shall furnish all labor, materials, and equipment necessary to complete the acoustical work in accordance with this section of the specifications and the applicable drawings.

C. Substitutions will not be permitted for materials and methods covered in this section.

GENERAL CONDITIONS

A. Installation of Celotone mineral fiber products shall not begin until all wet work such as plastering, concrete and terrazzo work is completed and thoroughly dried out. The building shall be closed to the weather and suitable mechanical ventilation supplied before, during and after installation to maintain condition ranges of 60°F to 85°F. at not more than 87% R.H. These materials are not recommended for areas subject to continued high humidity such as swimming pools, kitchens and similar locations. To properly evaluate ceiling installations, final inspections and approvals shall be delayed until occupancy lighting is in operation.

Where light from surface mounted fixtures, cove lights or natural illumination from windows extending to or near the ceiling level strikes the ceiling surfaces at a low angle, even slight uneveness of joints or surfaces may result in an unsatisfactory appearance. Under such conditions, bevel edge materials should be used.

The acoustical material shall not be used as support for or carry loading of additional insulation, light fixtures, etc.

B. The acoustical contractor shall be responsible for the examination and acceptance of all surfaces and conditions affecting the proper installation of his material, and shall not proceed until all unsatisfactory conditions have been corrected by others.

Celotex

PROTECTONE® MINERAL FIBER TILE AND PANELS FOR TIME-RATED CONSTRUCTION

MATERIALS:

A. The acoustical material shall be Protectone Mineral Fiber tile as manufactured by The Celotex Corporation. Tile shall meet the requirements of Federal Specification SS-S-118a, Class 25. The material shall also be classified by Underwriters' Laboratories, Inc., under Hazard Classification for a flame spread of 0-25 and Fire Resistance Classification Design No. (insert applicable design number).

B. Materials shall be ¾" thick, (pattern), (size) having a noise reduction coefficient of (.00) and a sound attenuation range, STC, of (00-00). The material shall have a factory applied washable white finish and a light reflection value of (00)%. (Refer to page 7 herein for selection of pattern, size and acoustical properties.)

INSTALLATION:

A. The acoustical contractor shall furnish and install the concealed suspension system (H&T, Z runners or UL time-rated direct hung T&T) to meet the UL time-rated design specified above in strict accordance with the manufacturer's recommendations in order to provide the required time-rated assembly specified.
(For Lay-in Installation)

The acoustical contractor shall furnish and install the UL classified time-rated exposed grid suspension system as manufactured by (specify mfr.) in strict accordance with manufacturers recommendations in order to provide the required time-rated assembly specified.

B. The acoustical contractor shall furnish and install the UL Classified, Celotex Protectone Mineral Tile specified in strict accordance with the manufacturer's recommendations to provide the required time-rating specified.

C. All materials and workmanship furnished under this contract shall be guaranteed by the acoustical contractor for a period of one year from completion date, and on written demand by the architect, any defective materials or workmanship shall be replaced or corrected.

SAFETONE® MINERAL FIBER TILE AND PANELS

MATERIALS:

A. The acoustical material shall be Safetone Mineral Fiber Tile as manufactured by The Celotex Corporation. Tile shall meet the requirements of Federal Specification SS-S-118a, Class 25. The material shall also be classified by Underwriters' Laboratories, Inc., under Hazard Classification for a flame spread of 0-25.

B. Materials shall be ¾" thick, (pattern) (size), having a noise reduction coefficient of (00) and a sound attenuation range, STC, of (00-00). The material shall have a factory applied washable white finish and a light reflection value of (00)%. (Refer to page 7 herein for selection of pattern, size and acoustical properties.)

INSTALLATION:

A. The acoustical contractor shall furnish and install the concealed suspension system (H&T, Z runners or direct hung T&T) in strict accordance with the manufacturers recommendations in order to provide a satisfactory installation.
(For Lay-in Installation.)

The acoustical contractor shall furnish and install the exposed grid system (T&T, Celo-loc, lo-gloss textured, or Celo-loc lo-fissured), in strict accordance with the manufacturers recommendations in order to provide a satisfactory installation.

B. The acoustical contractor shall furnish and install the Celotex Safetone Tile in strict accordance with the manufacturer's recommendations in order to provide a satisfactory installation.
(For Adhesive Application)
The acoustical contractor shall install the acoustical material with an approved acoustical adhesive in strict accordance with the adhesive manufacturer's recommendations.

C. All materials and workmanship furnished under this contract shall be guaranteed by the acoustical contractor for a period of one year from completion date, and on written demand by the architect, any defective materials or workmanship shall be replaced or corrected.



Acoustiform®
Acoustical Medium Density Lay-in Panels

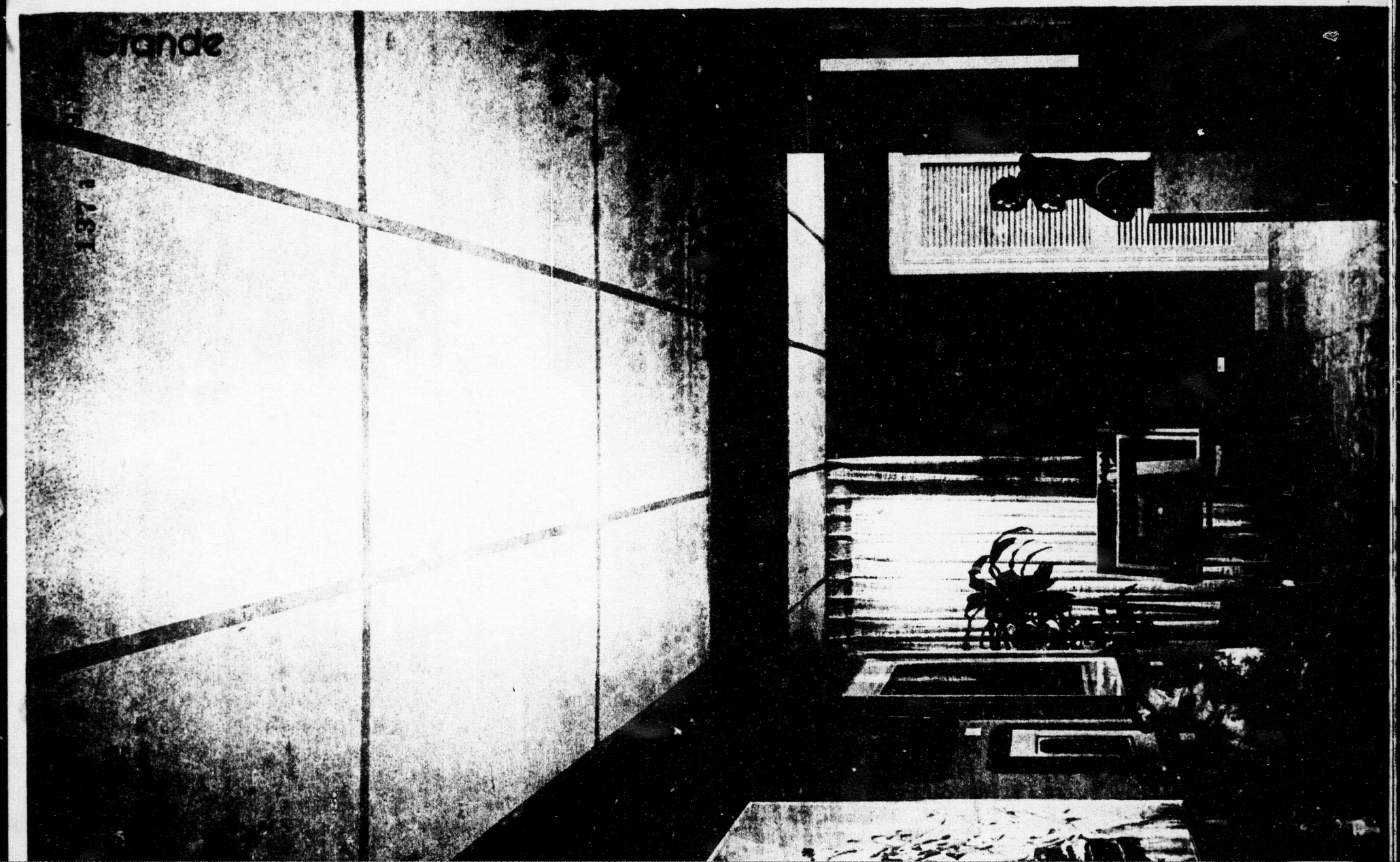
Celotex Acoustiform panels are the widely-acclaimed no-sag, no-warp, medium density acoustical ceilings seen in shopping centers, supermarkets, department stores, gymnasiums, indoor swimming pools.

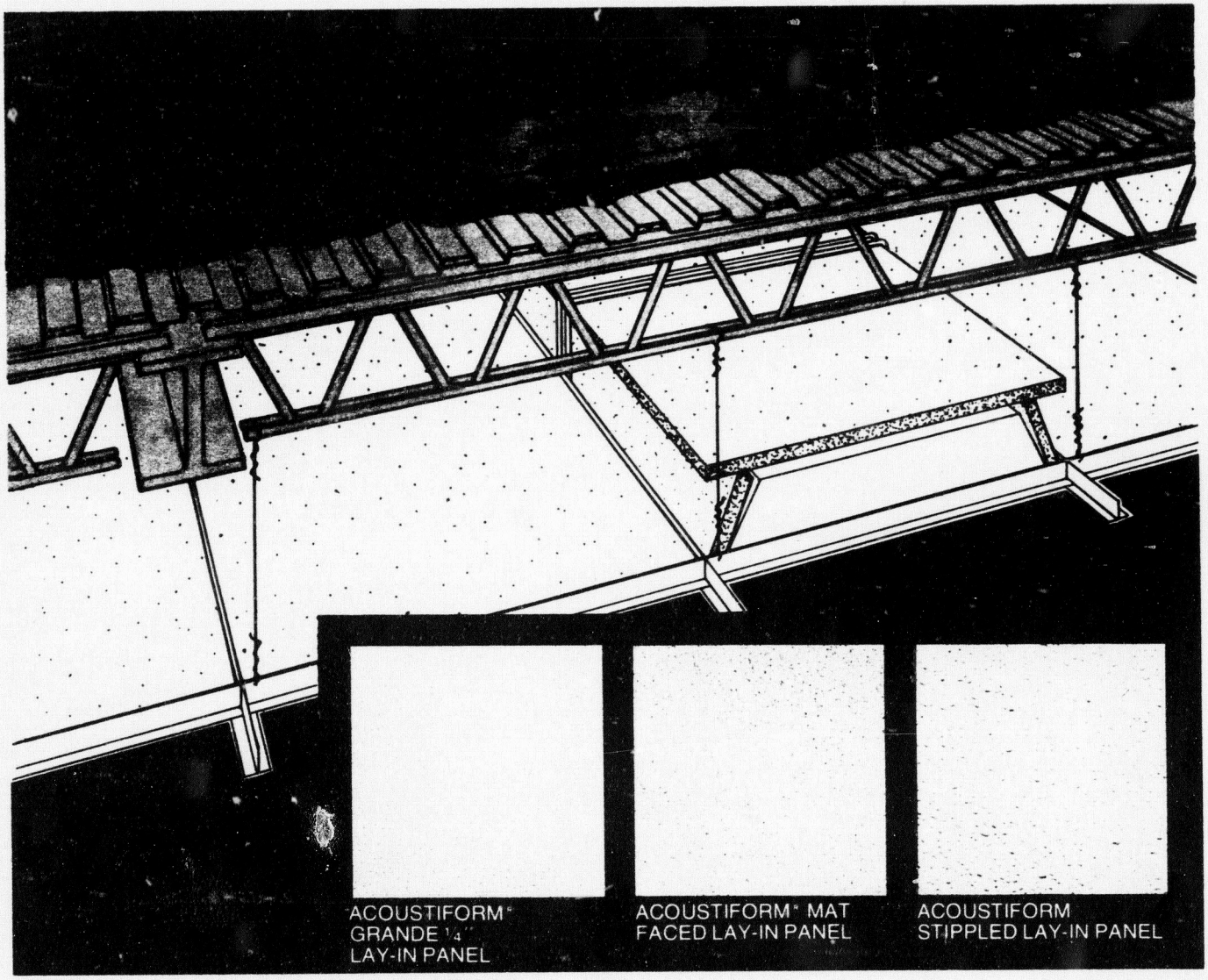
Along with product stability, Acoustiform lay-in panels offer acoustical efficiency, lightness in weight and handling ease. They are manufactured with a composition of bonded mineral fibers in the precise density to provide ideal porosity for maximum sound absorption – the while maintaining rigidity, strength and dimensional stability. The panels are lighter in weight than conventional mineral fiber panels and are extraordinarily resistant to moisture, shrinkage or expansion. Acoustiform panels can be installed on the job before "wet work" is completed with full assurance of product stability. Grande ¼" thick panels provide the same stability and acoustical properties of Acoustiform plus the added benefits of ease of installation, economy of storage and transportation.

Special note! Both Mat Faced and Stippled panels are available in Protectone (time-rated) 1" thick units. Here are quality *medium density* lay-in panels that meet UL time-rated floor/ceiling assembly requirements.

Another important availability, of particular significance for commercial large-area projects: Acoustiform panels may be obtained in 30" x 60" size for modern 5' modular construction.

The Mat Faced panels have a white coating over a finely textured mat base; the Stippled units, a white-on-white stippled effect on mat base.


Grande



ACOUSTIFORM® GRANDE ¼" LAY-IN PANEL

ACOUSTIFORM® MAT FACED LAY-IN PANEL

ACOUSTIFORM STIPPLED LAY-IN PANEL

CROSS-SECTION, TIME-RATED CONSTRUCTION

ACOUSTIFORM LAY-IN PANELS Technical Data, Including Sound Absorption Coefficients

PRODUCT		Thickness	Nominal Size	Mounting	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	NRC	Thermal Cond.		
Protectone Lay-In Panel	Mat Faced	1"	2' × 4'	7	.58	.86	.75	.99	1.01	.96	.85-.95	0.25	.75	.82
	Stippled	1"		7	.58	.78	.72	.92	.96	.87	.80-.90	0.23	.75	.82
Safetone† Lay-In Panel	Mat Faced	5/8"		7	.61	.75	.66	.83	.90	.94	.75-.85	0.25	.66	.82
	Stippled	5/8"		7	.62	.77	.68	.84	.92	.93	.75-.85	0.25	.69	.82
Grande†††	Textured	¼"		7	—	.65	.52	.55	.62	—	.55-.65	0.30	.50	.82

NOTE: Safetone Mat Faced and Stippled panels are also available 5/8" × 30" × 60" for 5' modular construction.

PROTECTONE UL Time-Rated Floor/Ceiling Assemblies

PATTERN	NOMINAL SIZE AND THICKNESS	EDGE DETAIL	SUSPENSION SYSTEM	ASSEMBLY DESIGNATION	HOURLY RATING	UL DESIGN NUMBER	STC		
Mat Faced Stippled	1" × 2' × 2' 1" × 2' × 4'	Trimmed	Exposed Grid	Concrete slab over steel bar joists penetrations	36-2 hours 274-2 hours	G208 G218	2 hr. 2 hr.	2 hr. 2 hr.	— —
				Concrete slab over blended deck, steel penetrations	62-2 hours	D203	2 hr.	2 hr.	2 hr.
	1" × 2' × 4'			Class A, B or C roof on 1" insulation metal deck, steel bar joists and beam penetrations	RC 12-1 hour	P204	1 hr.	45 min.	1 hr.

*Restrained: Floor and roof systems can be considered to be restrained when the surrounding or supporting structure is capable of resisting substantial thermal expansion from the floor or roof system. **Unrestrained: Construction not complying with the above is assumed to be free to rotate and expand. Refer to ASTM E119 Tentative Revision, for comprehensive explanation of concept of restrained and unrestrained construction assemblies.

Acoustiform mineral fiber products are manufactured under U.S. Patent No. 3,343,933.

NOTE: Lay-in panel illustrations are indicative of pattern only, and do not imply dimensions and edge detail.

†Safetone formulation: Class 25 Fed. Spec. SS-S-118a. ASTM E84; Classified by UL for Flame Spread Index 0-25.

†††Jim Walter Research Corp. Evaluation

Acoustiform
Architectural Specifications

SCOPE

A. The installation of all acoustical work covered in this section shall be by an approved Celotex acoustical contractor.

B. The acoustical contractor shall furnish all labor, materials, and equipment necessary to complete the acoustical work in accordance with this section of the specifications and the applicable drawings.

C. Substitutions will not be permitted for materials and methods covered in this section.

GENERAL CONDITIONS

A. Acoustiform materials shall not be used as support for or carry the loading of additional insulation, light fixtures, etc.

B. The acoustical contractor shall be responsible for the examination and acceptance of all surfaces and conditions affecting the proper installation of his materials, and shall not proceed until all unsatisfactory conditions have been corrected by others.

PROTECTONE ACOUSTIFORM LAY-IN PANELS FOR TIME-RATED CONSTRUCTION

MATERIALS:

A. The acoustical material shall be Protectone Acoustiform Mineral Fiber lay-in panels as manufactured by The Celotex Corporation. Panels shall meet requirements of Federal Specification SS-S-118a, Class 25. The material shall also be classified by Underwriters' Laboratories, Inc., under Hazard Classification for flame spread 0-25 and Fire Resistance Classification Design No. (insert applicable design number).

B. Materials shall be 1" thick, (pattern), (size) having a noise reduction coefficient of (.00). The material shall have a factory applied washable white finish and a light reflection value of (00)%. (Refer to page 12 for selection of product and acoustical properties).

INSTALLATION:

A. The acoustical contractor shall furnish and install the UL labeled, time-rated exposed grid system, as manufactured by (specify mfr.) in strict accordance with the manufacturer's recommendations in order to provide a satisfactory installation.

B. The acoustical contractor shall furnish and install the UL labeled Celotex Protectone Acoustiform Lay-in panels in strict accordance with the manufacturer's recommendations in order to provide the time-rating specified.

C. All materials and workmanship furnished under this contract shall be guaranteed by the acoustical contractor for a period of one year from completion date and on written demand by the architect any defective materials or workmanship shall be replaced or corrected.

SAFETONE ACOUSTIFORM LAY-IN PANELS

MATERIALS:

A. The acoustical material shall be Safetone Acoustiform Mineral Fiber lay-in panels as manufactured by The Celotex Corporation. Panels shall meet the requirements of Federal Specification SS-S-118a, Class 25. The material shall also be classified by Underwriters' Laboratories, Inc., under Hazard Classification for flame spread of 0-25.

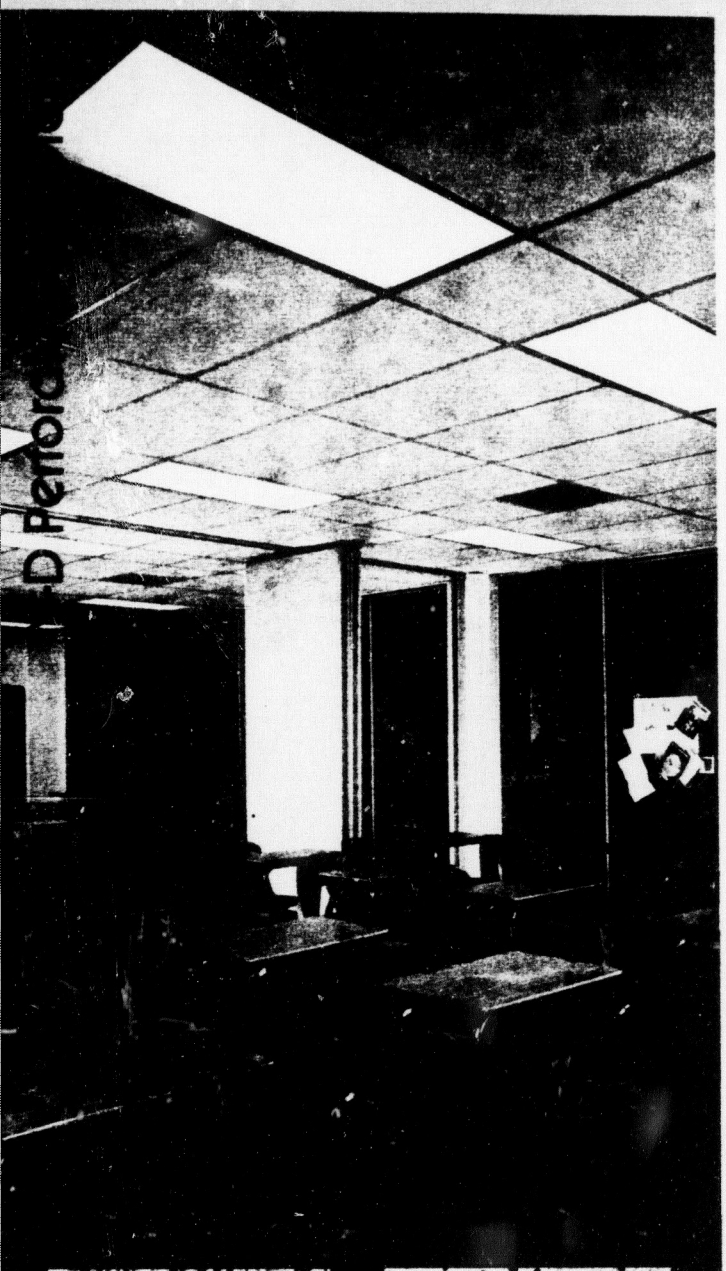
B. Materials shall be (pattern,) (thickness), (size) having a noise reduction coefficient of (.00). The material shall have a factory applied washable white finish and a light reflection value of (00)%. (Refer to page 12 for selection of product and acoustical properties.)

INSTALLATION:

A. The acoustical contractor shall furnish and install the exposed grid system as manufactured by (specify mfr.) in strict accordance with the manufacturer's recommendations in order to provide a satisfactory installation.

B. The acoustical contractor shall furnish and install the Celotex Safetone Acoustiform lay-in panels in strict accordance with the manufacturer's recommendations in order to provide a satisfactory installation.

C. All materials and workmanship furnished under this contract shall be guaranteed by the acoustical contractor for a period of one year from completion date, and on written demand by the architect, any defective materials or workmanship shall be replaced or corrected.



High Density Acoustical Lay-In Panels

Celotex® High Density acoustical lay-in panels are recognized as standard for ideal, all-around ceiling quality and performance. Their use is widespread where large ceiling expanses are involved...in schools, shopping centers, office areas, food processing plants, manufacturing operations.

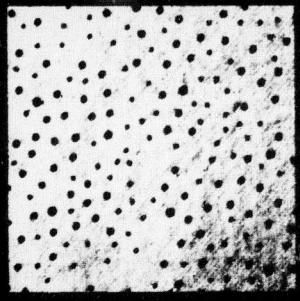
Ceilings of High Density panels have an unusually handsome appearance. Notably effective is the nondirectional pattern concept – in N-D Fissuretone®, N-D Perforated and N-D Perforated Stippled panels for a monolithic effect.

Sound absorption is excellent. Sound attentuation value (room-to-room through plenum sound transmission rating) is high. Here, too, are all the inherent advantages of lay-in panel suspended ceilings...ease of installation...ease of cleaning, maintenance...ease of access to utilities concealed above the ceiling.

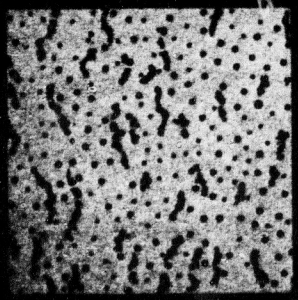
Celotex High Density lay-in panels are manufactured under a wet-felted process. The acoustical efficiency is achieved through decorative arrangements of varied-size, sound-absorbing perforations, or a combination of perforations and sound-absorbing mechanical fissures. In manufacture the mineral fibers are specially formulated and bonded to assure dimensional stability and strength.



N-D* FISSURETONE* LAY-IN PANEL



N-D PERFORATED LAY-IN PANEL



FISSURETONE LAY-IN PANEL

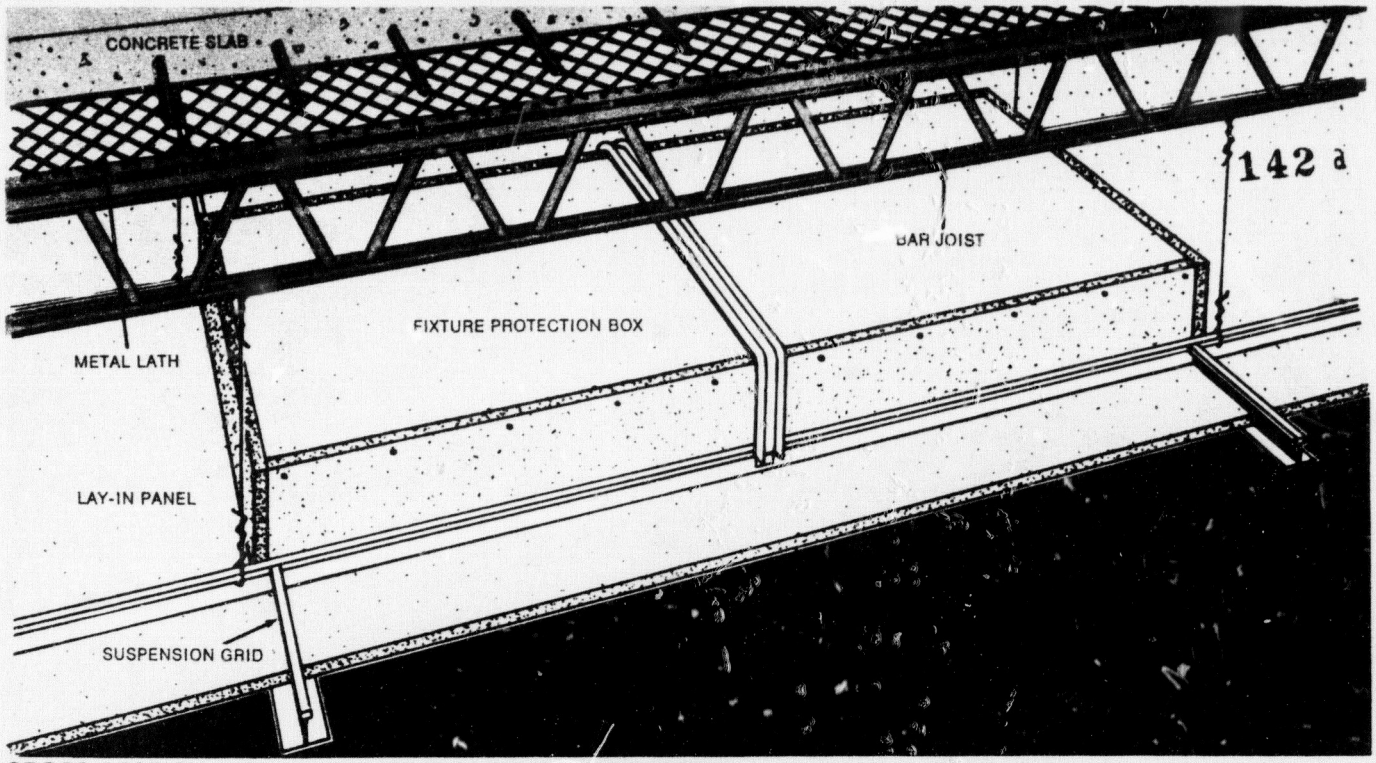


N-D PERFORATED STIPPLED LAY-IN PANEL

NOTE: Lay-in panel illustrations are indicative of pattern only and do not imply dimensions and edge detail.

*N-D (NONDIRECTIONAL)

141a
9.1/CeL
Fissuretone



CROSS-SECTION, HIGH DENSITY TIME RATED CONSTRUCTION

HIGH DENSITY LAY-IN PANELS Technical Data, Including Sound Absorption Coefficients

PRODUCT		Thick-ness	Size	Mount-ing	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	NRC Range	Thermal Cond. K Factor	Approx. Wt. Lbs. Per Sq. Ft.	Light Reflec-tion
Protectone Lay-In Panel	Fissuretone	5/8"	2' ×4'	7	29	27	48	79	81	80	55-65	0.35	1.0	79
	N-D Fissuretone				30	33	52	82	77	77	55-65	0.35	1.0	77
	N-D Perforated				27	26	52	75	68	53	50-60	0.35	1.1	82
	N-D Perforated Stippled				26	26	50	75	70	48	50-60	0.35	1.1	80
Safetone† Lay-In Panel	Fissuretone	5/8"	2' × 4'	7	31	28	49	75	78	71	55-65	0.39	0.9	81
	N-D Fissuretone				36	34	55	81	73	71	55-65	0.39	0.9	81
	N-D Perforated				37	34	57	84	69	58	55-65	0.39	0.9	84
	N-D Perforated Stippled				30	28	49	72	66	56	50-60	0.39	1.0	79

HIGH DENSITY LAY-IN PANELS Normalized Attenuation Factors

PRODUCT		Thick-ness	Size	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	STC Range
Protectone Lay-In Panel	Fissuretone	5/8"	2' × 4'	(35)	40	36	34	29	32	34	36	38	42	44	50	56	56	57	57	40-44
	N-D Fissuretone			32	38	36	28	27	29	30	32	33	35	40	44	51	52	58	60	35-39
	N-D Perforated			33	(42)	38	32	31	34	34	38	42	45	48	53	56	58	60	59	40-44
	N-D Perforated Stippled			32	38	34	31	30	33	35	38	40	43	46	49	53	53	53	54	40-44
Safetone Lay-In Panel	Fissuretone	5/8"	2' × 4'	28	34	32	26	27	30	31	34	37	39	43	47	51	52	53	54	35-39
	N-D Fissuretone			30	36	36	28	28	31	32	34	36	39	42	48	52	53	55	57	35-39
	N-D Perforated			27	35	34	27	26	30	31	33	36	38	41	48	52	55	55	55	35-39
	N-D Perforated Stippled			28	34	35	26	28	32	32	36	38	41	45	47	50	50	51	51	35-39

PROTECTONE UL Time-Rated Floor/Ceiling Assemblies

PATTERN	NOMINAL SIZE AND THICKNESS	EDGE DETAIL	SUSPENSION SYSTEM	ASSEMBLY CONSTRUCTION	FORMER DESIGN NUMBER	NEW DESIGN NUMBER	ASSEMBLY RATING Res.*	ASSEMBLY RATING UNRES **	ASSEMBLY RATING BEAM UNRES
N-D Perforated N-D Fissuretone Fissuretone N-D Perforated Stippled	5/8" × 2' × 2' 5/8" × 2' × 4'	Trimmed	Exposed Grid	Wood deck over wood joists penetrations	22-1 hour	L201	—	1 hr.	—
				Concrete slab over steel bar joists	35-2 hours	G245	2 hr.	2 hr.	—
				Concrete slab over steel bar joists – penetrations	36-2 hours 274-2 hours	G208 G218	2 hr. 2 hr.	2 hr. 2 hr.	— —
				Concrete slab over blended deck-steel beam – penetrations	62-2 hours (4 hr. beam)	D203	2 hr.	2 hr.	4 hr.
				Concrete slab over blended deck-steel beam – lights only	47-3 hours (4 hr. beam)	D205	3 hr.	3 hr.	4 hr.
	5/8" × 2' × 4'			3½" or 2½" Concrete slab over steel bar joists and beams – penetrations	—	G213	3 hr. or 2 hr.	2 hr.	3 hr.
				Class A, B or C roof on 1" insulation metal deck, steel bar joists and beam penetrations	RC 12-1 hour	P204	1 hr.	45 min.	1 hr.
	5/8" × 2' × 5'			Concrete slab over steel bar joists – penetrations	36-2 hours	G208	2 hr.	2 hr.	—

*Restrained: Floor and roof systems can be considered to be restrained when the surrounding or supporting structure is capable of resisting substantial thermal expansion from the floor or roof system. **Unrestrained: Construction not complying with the above is assumed to be free to rotate and expand. Refer to ASTM E119 Tentative Revision, for comprehensive explanation of concept of restrained and unrestrained construction assemblies.

NOTE: High density panels are also available with PlastiGard finish (scrubbable acrylic over-spray).

†Safetone formulation: Class 25 Fed. Spec. SS-S-118a; ASTM E84; Classified by UL for Flame Spread Index 0-25.

High Density Architectural Specifications

SCOPE

A. The installation of all acoustical work covered in this section shall be by an approved Celotex acoustical contractor.

B. The acoustical contractor shall furnish all labor, materials, and equipment necessary to complete the acoustical work in accordance with this section of the specifications and the applicable drawings.

C. Substitutions will not be permitted for materials and methods covered in this section.

GENERAL CONDITIONS

A. Installation of wet felted lay-in panels shall not begin until all wet work such as plastering, concrete, and terrazzo work is completed and thoroughly dried out. The building shall be closed to the weather and suitable mechanical ventilation supplied before, during and after installation to maintain condition ranges of 60°F to 85°F at not more than 80% R.H. These materials are not recommended for areas subject to high humidity such as swimming pools, kitchens, and similar locations.

The acoustical materials shall not be used as support for or carry the loading of additional insulation, light fixtures, etc.

B. The acoustical contractor shall be responsible for the examination and acceptance of all surfaces and conditions affecting the proper installation of his material and shall not proceed until all unsatisfactory conditions have been corrected by others.

PROTECTONE® MINERAL FIBER LAY-IN PANELS FOR TIME-RATED CONSTRUCTION

MATERIALS:

A. The acoustical material shall be Protectone Mineral Fiber lay-in panels as manufactured by the Celotex Corporation. Panels shall meet the requirements of Federal Specification SS-S-118a, Class 25. The material shall also be classified by Underwriters' Laboratories, Inc., under Hazard Classification for a flame spread of 0-25 and Fire Resistance Classification, Design No. (Insert applicable design number).

B. Materials shall be ⅝" thick, (pattern), (size) having a noise reduction coefficient of (.00) and a sound attenuation range, STC, of (00). The material shall have a factory applied washable white finish having a light reflection value of (00)%. (Refer to page 16 for selection of product and acoustical properties.)

INSTALLATION:

A. The acoustical contractor shall furnish and install the UL classified, time-rated exposed grid suspension system as manufactured by (specify mfr.) in strict accordance with the manufacturer's recommendations in order to provide the required time-rated assembly specified.

B. The acoustical contractor shall furnish and install the UL classified, Celotex Protectone Mineral Fiber lay-in panels as specified in strict accordance with the manufacturer's recommendations to provide the time-rating specified.

C. All materials and workmanship furnished under this contract shall be guaranteed by the acoustical contractor for a period of one year from completion date, and on written demand by the architect, any defective materials or workmanship shall be replaced or corrected.

SAFETONE® MINERAL FIBER LAY-IN PANELS

MATERIALS:

A. The acoustical material shall be Safetone Mineral Fiber lay-in panels as manufactured by The Celotex Corporation. Panels shall meet the requirements of Federal Specification SS-S-118a, Class 25. The material shall also be classified by Underwriters' Laboratories, Inc., under Hazard Classification for a flame spread of 0-25.

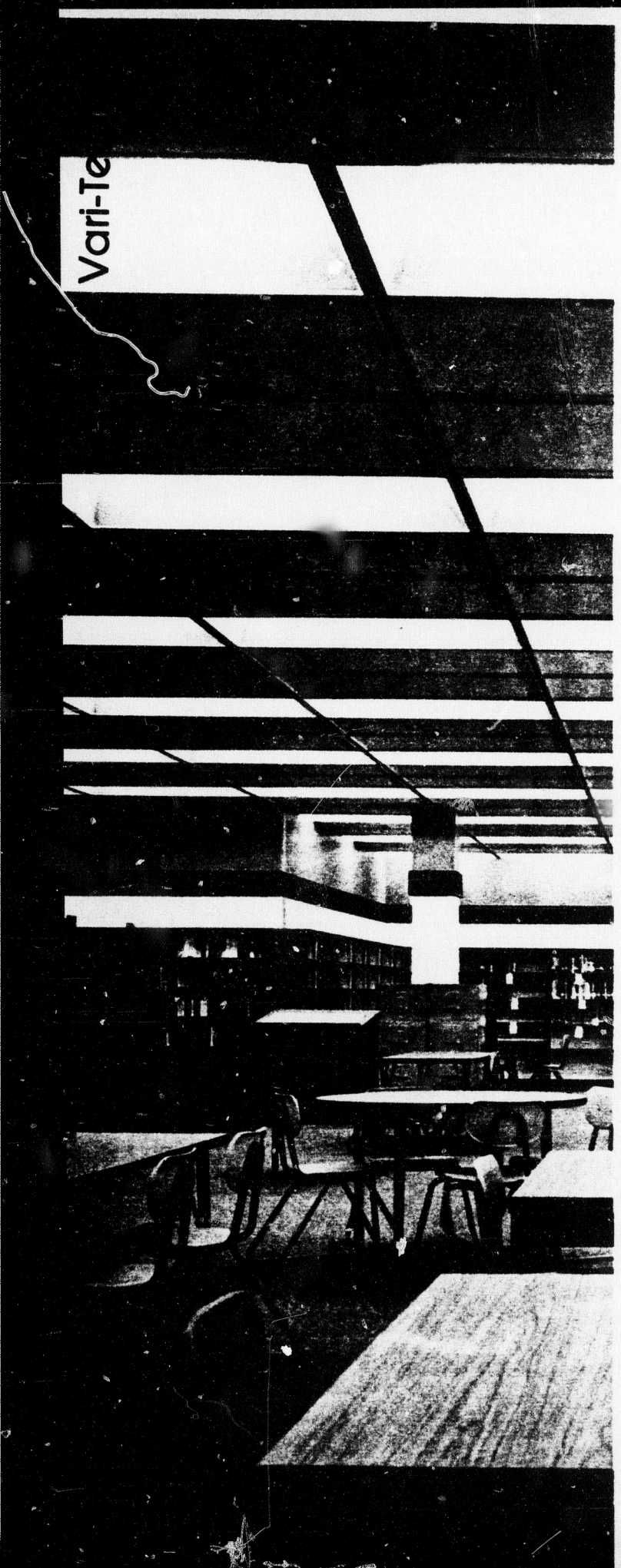
B. Materials shall be ⅝" thick, (pattern), (size) having a noise reduction coefficient of (.00) and a sound attenuation range, STC, of (00). The materials shall have a factory applied washable white finish having a light reflection value of (00)%. (Refer to page 16 for selection of product and acoustical properties.)

INSTALLATION:

A. The acoustical contractor shall furnish and install the exposed grid suspension system as manufactured by (specify mfr.) in strict accordance with the manufacturer's recommendations in order to provide a satisfactory installation.

B. The acoustical contractor shall furnish and install the Celotex Safetone Mineral Fiber lay-in panels in strict accordance with the manufacturer's recommendations in order to provide a satisfactory installation.

C. All materials and workmanship furnished under this contract shall be guaranteed by the acoustical contractor for a period of one year from completion date, and on written demand by the architect, any defective materials or workmanship shall be replaced or corrected.

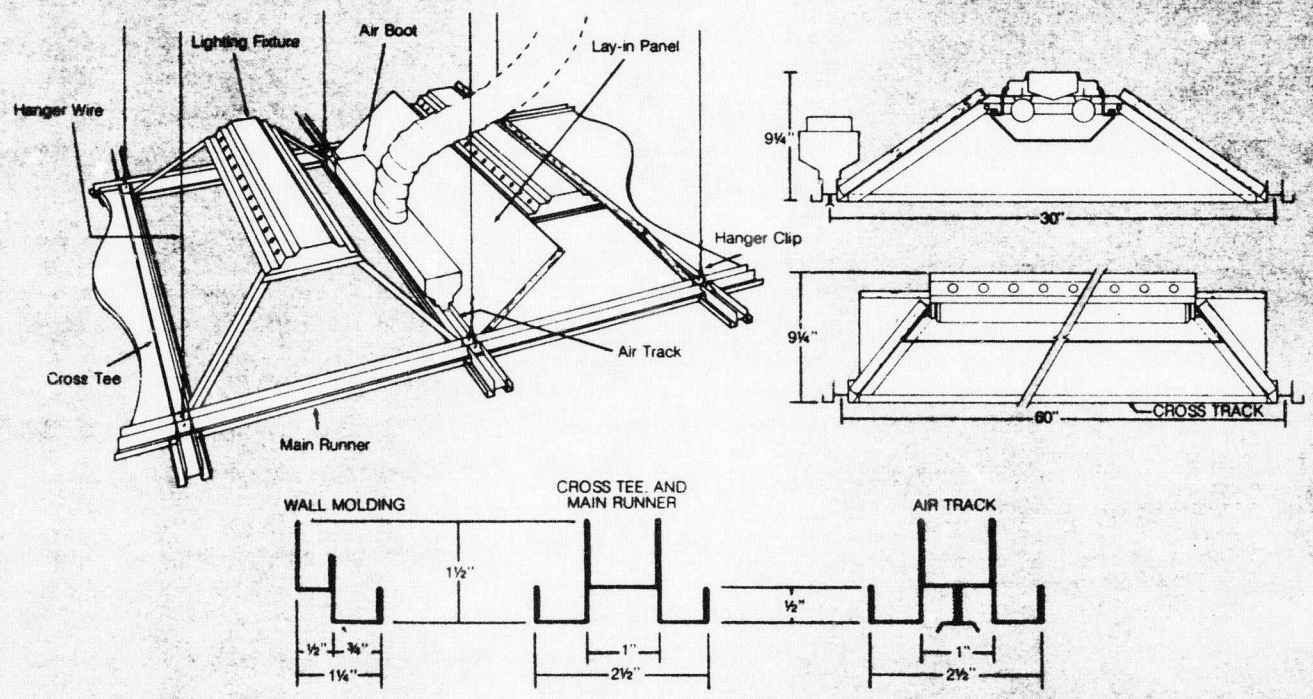


Vari-Tec 830 Ceiling System**

Vari-Tec 800 Series systems are interior ceiling systems possessing superior architectural and functional flexibility. Three basic systems are each structured on a five-foot module – the 830 (30" x 60" module), 860 (60"x 60" module) and the 860 flat module. They provide effective total control of the four chief environmental requisites of today's interiors: lighting, supply and exchange of conditioned air, acoustics and partitioning. In their time-rated assemblies, the 800 Series systems, offer fire-protection, too. Additionally, along with outstanding performance, aesthetically pleasing appearance is a feature.

The air return and supply components make these systems ideally suited for heat-with-light installations by providing up to 75% heat recovery from lamps and ballasts. Superior acoustical control and lighting efficiency are direct results of the coffered configurations. Easy attachment for movable partitions is an important advantage... space can be partitioned at will for a completely comfortable environment.

Vari-Tec 830 is a totally integrated coffered system. With 30" x 60" modules, this system offers a choice of lighting patterns with a wide range of illumination. All functions — lighting, acoustical control, air distribution, heat extraction, partition support, interior design — are coordinated in each module. This ceiling system lends itself admirably to the high performance criteria required by modern open-plan concepts.



TECHNICAL DATA

Module Sizes: 2'-6" x 5'-0".

Partition Support: On module lines in either direction.

Air Supply: Linear air diffuser on module line. 0-33 cfm/ft. air capacity. Directional vanes control volume supplied, adjust from horizontal to vertical throw. Supply through individual volume dampered boots.

Air Return: Adjustable return air damper on fixture provides removal of up to 75% of lamp and ballast heat.

Lighting: One or two lamp fluorescent fixture with integral heat extraction damper; mounted in a direct position with a wraparound acrylic lens.

Acoustical Control: Coffered sides. Celotex Vari-Tec 830 mineral fiber ceiling panels, attractively textured and finished, offer NRC ranges up to .65-.75; STC range, 35-39.

Suspension: All steel with baked enamel finish.

Approvals: Lighting fixture is IBEW labeled and UL listed. Ceiling panels meet the requirements of Fed. Spec. SS-S-118a, Class 25; UL Class A. UL classified for time-rated assemblies. Suspension tested per ASTM C635-69 procedures.

VARI-TEC 830 SOUND ABSORPTION COEFFICIENTS

ACOUSTICAL PRODUCT	MODULE	LIGHT FIXTURE	MOUNTing	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	NRC Range
5/8" Safetone® Nodular Panels	30" x 60"	Air Return All Modules Coffered[1]	7	48	55	49	55	55	43	50-60
5/8" Safetone Acoustiform Panels	30" x 60"	Air Return 50% of Modules Coffered	7	54	71	63	72	78	74	65-75
5/8" FR-2 Nodular Panels (UL Design P-220)	30" x 60"	Air Return 50% of Modules Coffered	7	40	42	45	54	55	44	45-55

VARI-TEC 830 NORMALIZED ATTENUATION FACTORS

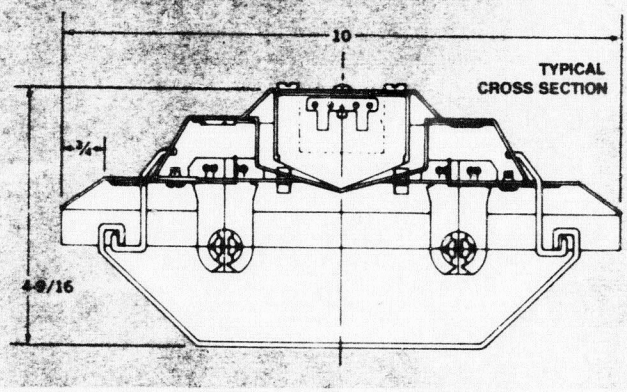
ACOUSTICAL PRODUCT	MODULE	LIGHT FIXTURE	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	STC Range
5/8" Safetone Nodular Panels	30" x 60"	Air Return All Modules Coffered1	22	31	29	25	24	28	31	35	37	38	40	41	40	41	48	53	35-39
5/8" FR-2 Nodular Panels (UL Design P-220)	30" x 60"	Air Return 50% of Modules Coffered	24	29	29	28	23	28	31	33	35	36	38	41	41	42	47	52	35-39

[1]Acoustical data performed using light fixture attenuators.



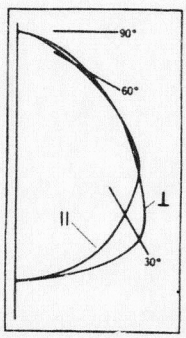
Vari-Tec 830 Lighting Data

EFFICIENCY OF FIXTURE AND OTHER SPECIFICATION DETAILS



The Vari-Tec 830 system provides high quality, high efficiency lighting. One-lamp and two-lamp fixtures are available. Also a special 5:1 lens, meeting the criteria for visual comfort probability and scissors curve.

PERCENTAGE OF EFFICIENCY		
Lighting	One-Lamp Fixture	Two-Lamp Fixture
Bare Lamp	78.9	77.7
W./Std. Lens	70.4	65.8
5:1 Lens	—	73.7
OTHER SPECIFICATION DETAILS		
Fixture Housing Metal Gauge	20 C.R.	20 C.R.
Weight of Standard Fixture	17.5 Lbs.	17.5 Lbs.
Type of Lamp	40W R.S.	40W R.S.
Standard Ballast	ETL – CBM – HPF – UL Label Class P Sound Rating: A	
Lens	Acrylic / 2-Lamp 5:1	
Voltage	120/277	120/277



ONE-LAMP PERFORMANCE

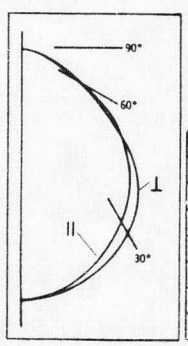
CIE TYPE — Direct
S/MH — 1.4

	AVG FL		MAX FL	
DEG	PARL	NORM	PARL	NORM
0	249	249	2229	2229
45	227	217	1415	1167
55	179	176	814	955
65	131	96	495	814
75	90	36	460	142
85	28	26	177	35

COEFFICIENTS OF UTILIZATION — ZONAL INTERFLECTANCE METHOD												
RF	30			10			10			10		
RC	80			80			70			50		
RW	50	30	10	50	30	10	50	30	10	50	30	10
0.6	33	28	24	32	28	24	32	27	24	31	27	24
0.8	43	37	33	41	36	32	40	36	32	40	35	32
1.0	49	43	39	47	42	38	46	42	38	45	41	38
1.25	56	50	45	52	47	44	52	47	44	50	47	43
1.5	61	55	50	56	52	48	55	51	48	54	50	48
2.0	67	61	57	61	57	54	60	57	54	59	56	53
2.5	71	66	62	64	60	57	63	60	57	62	59	57
3.0	74	69	65	66	63	60	65	62	60	64	61	59
4.0	78	74	70	68	66	64	68	65	63	66	64	62
5.0	81	77	74	71	68	66	69	67	66	68	66	65

MAINTENANCE FACTOR: GOOD .75 MEDIUM .65 POOR .55

COEFFICIENTS OF UTILIZATION — ZONAL CAVITY METHOD																			
EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20																			
RC	80				70				50				30				10		
RW	70	50	30	10	70	50	30	10	50	30	10		50	30	10		50	30	10
1	78	76	73	71	76	74	72	70	71	69	68		68	67	66		66	65	64
2	73	68	64	61	71	67	63	60	64	61	59		62	59	57		60	58	56
3	67	61	56	52	65	60	55	52	58	54	51		56	53	50		54	52	49
4	62	55	49	45	60	54	49	45	52	48	44		50	47	44		49	46	43
5	57	49	43	39	55	48	43	39	47	42	38		45	41	38		44	40	38
6	53	44	38	34	51	43	38	34	42	37	34		41	37	33		40	36	33
7	48	40	34	30	47	39	34	30	38	33	29		37	33	29		36	32	29
8	45	36	30	26	44	35	30	26	34	29	26		33	29	26		32	28	25
9	41	32	26	22	40	31	26	22	31	26	22		30	25	22		29	25	22
10	38	29	23	20	37	29	23	20	28	23	20		27	23	20		27	23	20



TWO-LAMP PERFORMANCE

CIE TYPE — Direct
S/MH — 1.2

	AVG FL		MAX FL	
DEG	PARL	NORM	PARL	NORM
0	512	512	2853	2853
45	444	416	2130	1864
55	323	354	1522	1978
65	238	169	989	1255
75	154	63	951	228
85	42	42	609	76

COEFFICIENTS OF UTILIZATION — ZONAL INTERFLECTANCE METHOD												
RF	30			10			10			10		
RC	80			80			70			50		
RW	50	30	10	50	30	10	50	30	10	50	30	10
0.6	31	27	23	31	26	23	30	26	23	30	26	23
0.8	40	35	31	39	34	31	38	34	30	37	33	30
1.0	46	41	37	44	39	36	43	39	36	43	39	36
1.25	52	47	42	49	45	41	48	44	41	47	44	41
1.5	57	51	47	53	49	45	52	48	45	51	47	45
2.0	63	58	53	57	53	50	56	53	50	55	52	50
2.5	66	62	58	60	56	54	59	56	54	58	55	53
3.0	69	65	61	62	59	57	61	58	56	60	57	55
4.0	73	69	66	64	62	60	63	61	59	62	60	58
5.0	75	72	70	66	64	62	65	63	62	63	62	61

MAINTENANCE FACTOR: GOOD .75 MEDIUM .65 POOR .55

COEFFICIENTS OF UTILIZATION — ZONAL CAVITY METHOD																			
EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20																			
RC	80				70				50				30				10		
RW	70	50	30	10	70	50	30	10	50	30	10		50	30	10		50	30	10
1	73	71	68	66	71	69	67	65	67	65	63		64	63	61		62	61	60
2	68	64	60	57	66	62	59	56	60	57	55		58	56	54		56	54	53
3	63	57	53	49	61	56	52	49	54	51	48		53	50	47		51	48	46
4	58	51	46	43	57	50	46	42	49	45	42		47	44	41		46	43	41
5	53	46	41	37	52	45	40	36	44	39	36		43	39	36		41	38	35
6	49	41	36	32	48	41	36	32	40	35	32		39	35	32		38	34	31
7	46	37	32	28	45	37	32	28	36	31	28		35	31	28		34	30	28
8	42	34	28	25	41	33	28	25	32	28	24		31	27	24		31	27	24
9	39	30	25	21	38	30	25	21	29	24	21		28	24	21		28	24	21
10	36	27	22	19	35	27	22	19	26	22	19		26	22	19		25	21	19

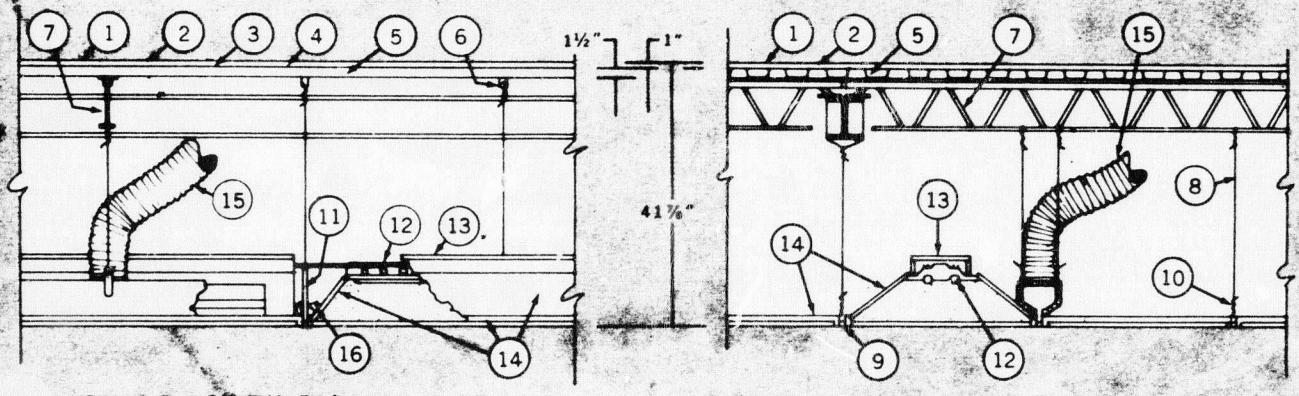
INDEPENDENT TESTING LABORATORIES

Vari-Tec 830 Time Rated System

Vari-Tec 830 is available in a time-rated system that meets fire-rating code requirements. In its 1-hour time-rated design (UL Roof and Ceiling Design No. P220, 1-hour), the Vari-Tec 830 Time-Rated Ceiling System provides added fire protection for the structure, without altering the performance features of the basic Vari-Tec 830 system.

DESIGN NO. P220

RESTRAINED ASSEMBLY RATING ..... 1 HOUR
UNRESTRAINED ASSEMBLY RATING ..... 1 HOUR
UNRESTRAINED BEAM RATING ..... 1 HOUR



1 Class A, B, or C Built-Up Roofing.
2 Mineral Fiber Boards: 1" Celo-Therm® Insulation.
3 Sheathing Material (Optional) with Vapor-Barrier.
4 Adhesive: ½" Ribbons, 6" o.c.
5 Steel Roof Deck: Fluted, Type B, 24 MSG Minimum.
6 Hanger Tab.
7 Steel Joists, 60" o.c.
8 Hanger Wire: No. 12 SWG Steel Wire, spaced 30" o.c.
9 Vari-Tec 800 Suspension Members.
10 Hanger Clip.
11 Light Fixture Support.
12 Vari-Tec 830 Light Fixture — 1 Fixture per 30 sq. ft. ceiling area.
13 Fixture Protection.
14 Acoustical Panels: Type ⅝" FR-2.
15 Flexible Duct: Class 0 or Class 1.
16 Gasketing: 3" x 17" Mineral Wool Batt at each end of light fixture module.

TECHNICAL DATA

Module Sizes: 2'6" x 5'0"

Partition Support: On module lines in either direction.

Air Supply: Linear air diffuser on module line. 0-33 cfm/ft. air capacity. Directional vanes control volume supplied, adjust from horizontal to vertical throw. Supply through individual volume dampered boots.

Air Return: Each fixture type is designed with effective heat extraction properties.

Lighting: One or two lamp fluorescent fixture with integral heat extraction damper; mounted in a direct position with a wraparound acrylic lens.

Acoustical Control: Coffered sides. Celotex Protectone Vari-Tec 830 mineral fiber ceiling panels. Under UL Design P220, 1-Hour, the panels provide NRC range of .45-.55; STC range, 35-39.

Suspension: All steel with baked enamel finish.

Approvals: Lighting fixture is IBEW labeled and UL listed. Ceiling panels meet the requirements of Fed. Spec. SS-S-118a, Class 25; UL Class A; ASTM E119. UL classified for time-rated assemblies.

NOTE: For Time-rated system Sound Absorption Coefficients and Attenuation Factors, see Table, page 19.

Vari-Tec 830
Architectural Specifications

SCOPE:

The work of this section shall consist of the furnishing of all labor, material, equipment, and services necessary for the installation of all Environmental Ceilings as shown in the drawings (Sheets No.) and as specified.

GENERAL:

Related work specified elsewhere.

A. The furnishing and installation of duct work up to and including the termination fittings for the attachment of flexible air tubes.

B. All electrical work, except the installation and connection of the lighting fixtures as furnished in this specification, to branch circuit wiring terminated in a junction box above the fixture or group of fixtures.

MATERIALS:

A. Suspension System: The suspension system shall be the Celotex Corporation Vari-Tec 800 Track Suspension System. Maximum height of the system shall not exceed 9¼". The grid shall be fabricated of 24 gauge cold rolled phosphatized steel with baked enamel matte finish. It shall be 2½" wide and 1½" high. All exposed surfaces shall be matte white finish except the 1" wide x ½" deep reveal on the center axis which shall be matte black finish. The five-foot cross tees shall snap-lock securely on to the center rail of the main runners. The wall moulding shall receive either the main track or cross tees on 30" or 60" centers without special punching. The main track shall be pre-punched 6" on center to accept cross tees.

B. Acoustical Panels: The acoustical panels shall be Safetone Vari-Tec 830 Mineral Fiber panels as manufactured by The Celotex Corporation. Panels shall meet the requirements of Federal Specification SS-S-118a, Class 25. The material shall also be classified by Underwriters' Laboratories, Inc., under Hazard Classification for a Flame Spread of 0-25 and Fire Resistance Classification. The material shall have a factory applied washable white finish and a minimum light reflection of .80.

C. Light Fixture: Fixtures shall be the Celotex Vari-Tec 830 Unit compatible only with the Vari-Tec 800 Track System. This fixture shall be of the direct type in that 100% of the fixture output is in the 180° zone.

The fixture housing shall be flanged on four sides to provide support for the acoustical board. The reflector plate shall be furnished in baked white enamel with a light reflectance not less than 85%.

The fixture shall be designed for air return by means of openings in the housing on each side of the fixture. When used for air return, the air volume is to be controlled by dampers attached to the fixture housing.

Fixtures shall use (one, two) standard type F 40 T 12 rapid-start, fluorescent lamps, as indicated on the drawings and listed in the fixture schedule. Ballast shall be of the high-power-factor type meeting the Certified Ballast Manufacturer's standards as certified by ETL, and carrying a U.L. Class P label. Fixtures shall have U.L. recessed fixture label. Fixtures shall be installed in each coffered module of the Vari-Tec 830 Ceiling System, as indicated on the drawings.

D. Lens: Lens shall be of 100% virgin acrylic resins with burning rate of 2½" per min., according to ASTM D-635, and shall be (special acrylic 5:1) designed as VariTec 830 Ceiling System diffuser. Lenses shall be used in all areas as indicated by the plans. Lenses shall be removable for easy access to lamps, ballast and wiring.

E. Supply Air Boot: Supply air boot shall be The Celotex Vari-Tec 800 Supply Air Boot constructed of 24 Ga. steel with galvanneal finish. The duct inlet connections shall be (5") or (6") with a built-in volume control and deflecting damper. The damper shall be adjustable from the room space through the air track slot without removing any system components. Duct connections shall be centered on the air boot.

F. Air Track: Air track shall be the Celotex Vari-Tec 800 Supply Air Track with fully adjustable air deflectors for air discharge in one or two directions. The air deflectors shall be painted matte black to match the center reveal of the track. The air track shall conform to system specifications regarding over-all width and finish.

INSTALLATION:

A. Suspension System: The Celotex Corporation Systems Contractor shall furnish and install the Celotex Vari-Tec 800 Track Suspension System. The system shall be installed in accordance with the drawings, and in accord with the manufacturer's recommendations. The suspension system shall be supported by #12 Ga. hanger wires placed 30" on center along the main runner.

B. Air Bar and Air Boot: This work shall include furnishing and installing Celotex Vari-Tec 800 Supply Air Track Units as indicated on the plans. (Each unit shall consist of one Supply Air Boot and one air track.)

C. Light Fixtures: This work shall include the installation of fixtures, wiring to the feed junction boxes, and fixture-to-fixture wiring as indicated on the plans. When used, the lens shall be attached to the bracket according to the manufacturer's specifications.

D. Acoustical Panel: The Celotex Ceiling Systems Contractor shall furnish and install the Vari-Tec 830 ceiling panels as specified or designated by the drawings. The panels shall be installed in strict accord with manufacturer's recommendations in order to provide a satisfactory installation.

E. Cleaning: Following installation, soiled or discolored surfaces of the system should be cleaned. Damaged or improperly installed units shall be removed and replaced.

SPECIAL CONDITIONS

When system is installed as "floating ceiling", main runners must be used as perimeter. All perimeter corners of main runners must be field miter-cut, and a perimeter corner connector pop-riveted to runners to hold sections in alignment. Outside and inside corner caps are snapped over flange of grid members and secured in place by bending tabs over outside edge of each flange.

Vari-Tec 830 Time Rated
Architectural Specifications

(UL Roof and Ceiling Design No. P220 — 1 Hour Restrained and Unrestrained — 1 Hour Beam)

SCOPE:

The work of this section shall consist of the furnishing of all labor, material, equipment, and services necessary for the installation of all Environmental Ceilings as shown in the drawing (Sheets No.) and as specified.

GENERAL:

Related work specified elsewhere:

A. The furnishing and installation of duct work up to and including the termination fittings for the attachment of flexible air tubes.

B. All electrical work, except the installation and connection of the lighting fixtures as furnished in this specification, to branch circuit wiring terminated in a junction box above the fixture or group of fixtures.

MATERIALS:

A. Suspension System: The suspension system shall be the Celotex Corporation Vari-Tec 800 Track Suspension System. Maximum height of the system shall not exceed 10½". The grid shall be fabricated of 24 gauge cold rolled phosphatized steel with baked enamel matte finish. It shall be 2½" wide and 1½" high. All exposed surfaces shall be matte white finish except the 1" wide x ½" deep reveal on the center axis which shall be matte black finish. The five-foot cross tees shall be snapped securely on to the center rail of the main runners and locked into position. The wall moulding shall receive either the main track or cross tees on 30" or 60" centers without special punching. The main track shall be pre-punched 6" on center to accept cross tees. Components shall be classified for UL Roof and Ceiling Design No. P220.

B. Acoustical Panels: The acoustical panels shall be Vari-Tec 830 FR-2 Nodular Mineral Fiber Panels as manufactured by The Celotex Corporation. Panels shall meet the requirements of Federal Specification SS-S-118a, Class 25. The material shall also be classified by Underwriters' Laboratories, Inc., under Hazard Classification for a Flame Spread of 0-25 and Fire Resistance Classification, UL Design P220. The material shall have a factory applied washable white finish and a minimum light reflection of .80.

C. Light Fixture: Fixtures shall be the Celotex Vari-Tec 830 Unit compatible only with the Vari-Tec 800 Track System. This fixture shall be of the direct type in that 100% of the fixture output is in the 180° zone.

The fixture housing shall be flanged on four sides to provide support for the acoustical board. The reflector plate shall be furnished in baked white enamel with a light reflectance not less than 85%.

The fixtures shall be designed for air return by means of openings in the housing on each side of the fixture. When used for air return, the air volume can be controlled by dampers attached to the fixture housing. Fixtures shall use (one, two) standard type F 40 T 12 rapid-start, fluorescent lamps, as indicated on the drawings and listed in the fixture schedule. Ballast shall be of the high-power-factor type meeting the Certified Ballast Manufacturer's standards as certified by ETL, and carrying a U.L. Class P label. Fixtures shall have U.L. recessed fixture label. Fixtures shall be installed in each coffered module of the Vari-Tec 830 Ceiling System, as indicated on the drawings.

D. Lens: Lens shall be of 100% virgin acrylic resins with burning rate of 2½" per min., according to ASTM D-635, and shall be (special acrylic 5:1) designed as VariTec 830 Ceiling System diffuser. Lenses shall be used in all areas as indicated by the plans. Lenses shall be removable for easy access to lamps, ballast and wiring.

E. Supply Air Boot: Supply air boot shall be The Celotex Vari-Tec 800 Supply Air Boot constructed of 24 Ga. steel with galvanneal finish. The duct inlet connections shall be (5") with a built-in volume control and deflecting damper. The damper shall be adjustable from the room space through the air track slot without removing any system components. Duct connections shall be centered on the air boot. Air boots shall be classified by UL for use in Roof and Ceiling Design No. P220.

F. Air Track: Air track shall be the Celotex Vari-Tec 800 Supply Air Track with fully adjustable air deflectors for air discharge in one or two directions. The air deflectors shall be painted matte black to match the center reveal of the track. The air track shall conform to system specifications regarding over-all width and finish. Air track shall be UL classified for Roof and Ceiling Design P220.

INSTALLATION:

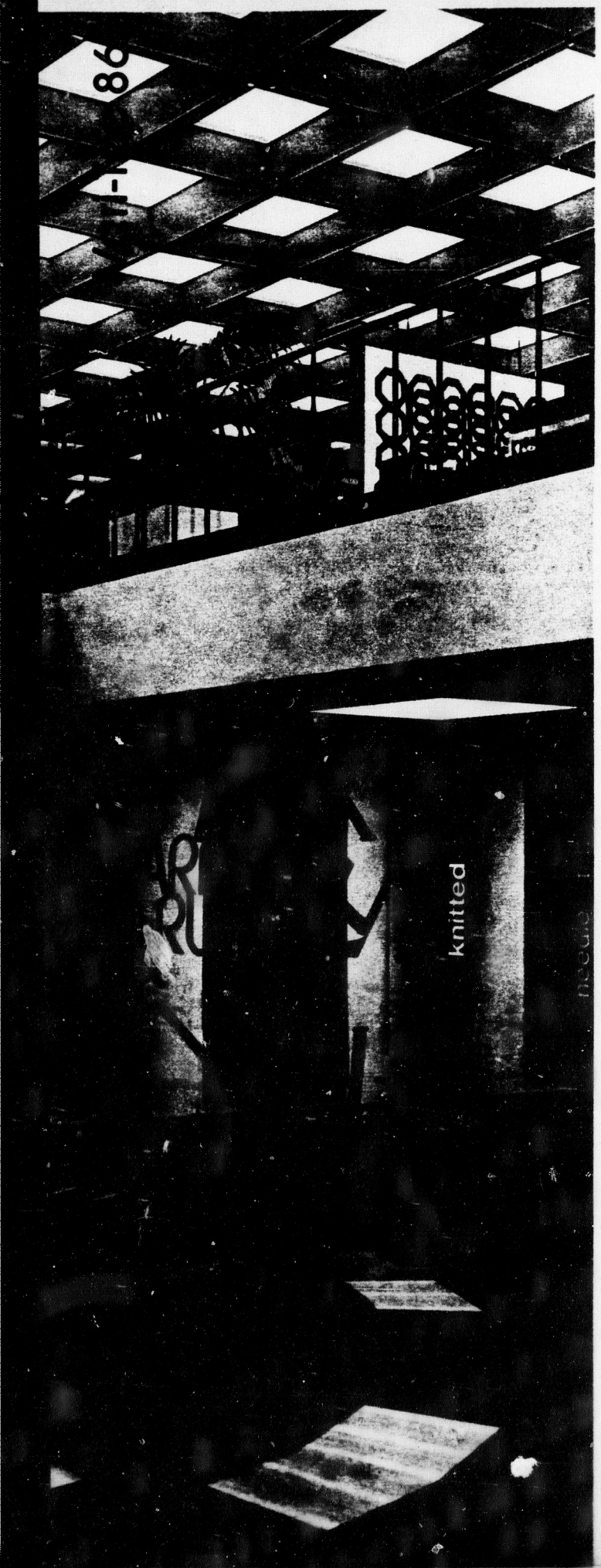
A. Suspension System: The Celotex Corporation Systems Contractor shall furnish and install the Celotex Vari-Tec 800 Track Suspension System. The system shall be installed in accordance with the drawings, and in accord with the manufacturer's recommendations to provide the time-rating. The suspension system shall be supported by #12 Ga. hanger wires placed 30" on center along the main runner, and cross tees.

B. Air Bar and Air Boot: This work shall include furnishing and installing Celotex Vari-Tec 800 Supply Air Track Units as indicated on the plans. (Each unit shall consist of one Supply Air Boot and one air track.)

C. Light Fixtures: This work shall include the installation of fixtures, wiring to the feed junction boxes, and fixture-to-fixture wiring as indicated on the plans. When used, the lens shall be attached to the bracket according to the manufacturer's specifications.

D. Acoustical Panel: The Celotex Ceiling Systems Contractor shall furnish and install the Vari-Tec 830 FR-2 Nodular ceiling panels. The panels shall be installed in strict accord with manufacturer's recommendations in order to provide a satisfactory installation and to achieve the required time-design rating.

E. Cleaning: Following installation, soiled or discolored surfaces of the system should be cleaned. Damaged or improperly installed units shall be removed and replaced.



Vari-Tec 860 Ceiling System*

The Vari-Tec 860 system offers notable aesthetic symmetry of design in an all-over, concentric square effect — a square within a square — in the coffered configuration. Available, too, in a distinctive linear design; also in a flat module system. A variety of fixture types may be utilized. Another feature is the exceptional flexibility of the luminaires.

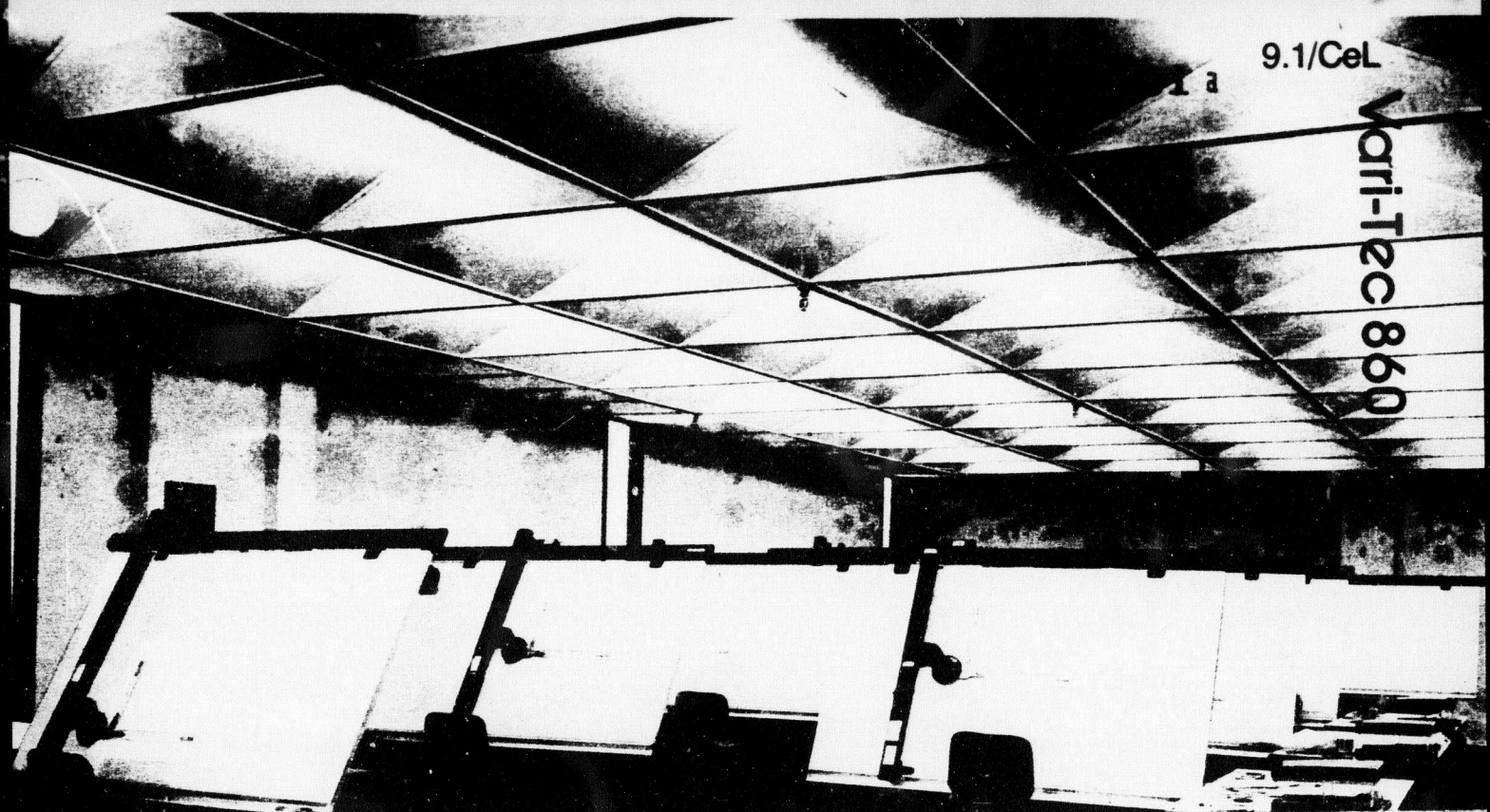
In its 2-hour time-rated design (UL Floor and Ceiling Design D213, 2-Hour) this system provides fire protection for the assembly, without altering or modifying the performance features of the basic system.

*U.S. Pat. No. 3,786,602

FIXTURE SPECIFICATIONS AND EFFICIENCY

FIXTURE	VT-860-10	VT-860-24	VT-860-36
Fixture Housing Metal Gauge	20 C.R.	20 C.R.	20 C.R.
Weight of Standard Fixture	21 Lbs.	28 Lbs.	45 Lbs.
Type of Lamp	2-3 Lamp 40W R.S.	2-Lamp 40W R.S. "U"	4-Lamp 30W
Standard Ballast	ETL — CBM — HPF UL Label Class P Sound Rating A		
Standard Lens Type	Acrylic Prism	Acrylic Framed C-12 Prism	Acrylic Framed C-15 Prism
Voltage		120/227	
Heat Exchange Feature	YES		
Percentage of Efficiency	73.6	60.2	70.9

All steel parts receive a special phosphate bath, are rinsed and etched in a chrome acid preparation. Finish: Electrostatic application of baked white enamel with not less than 85% reflectance factor.



TECHNICAL DATA

Module Size: 5'-0" x 5'-0".

Partition Support: On module lines in either direction.

Air Supply: Linear air diffuser on module line. 0-33 cfm/ft. air capacity. Directional vanes control volume supplied, adjust from horizontal to vertical throw. Supply through individual volume dampered boots.

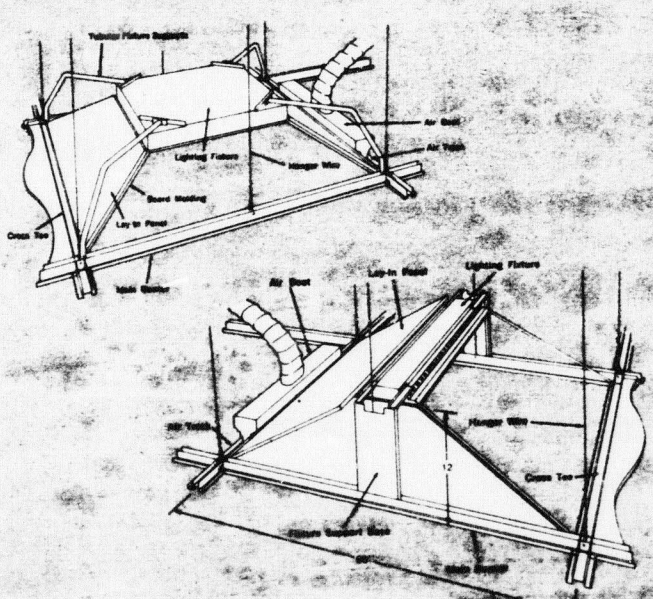
Air Return: Each fixture type is designed with effective heat extraction properties.

Lighting: A selection of 2' x 2', 3' x 3', 10" x 48" fixtures. Acrylic lens, varied lamp types.

Acoustical Control: Coffered sides. Celotex Vari-Tec 860 mineral fiber ceiling panels, attractively textured and finished, provide NRC ranges up to .55-.65; STC range, 40-44. Under UL Design D213, 2-Hour, the panels offer NRC range, .45-.55; STC range, 40-44.

Suspension: All steel with baked enamel finish.

Approvals: Lighting fixture is IBEW labeled and UL listed. Ceiling panels meet the requirements of Fed. Spec. SS-S-118a, Class 25; UL Class A, UL classified for time-rated assemblies. Suspension tested per ASTM C635-69 Procedures.

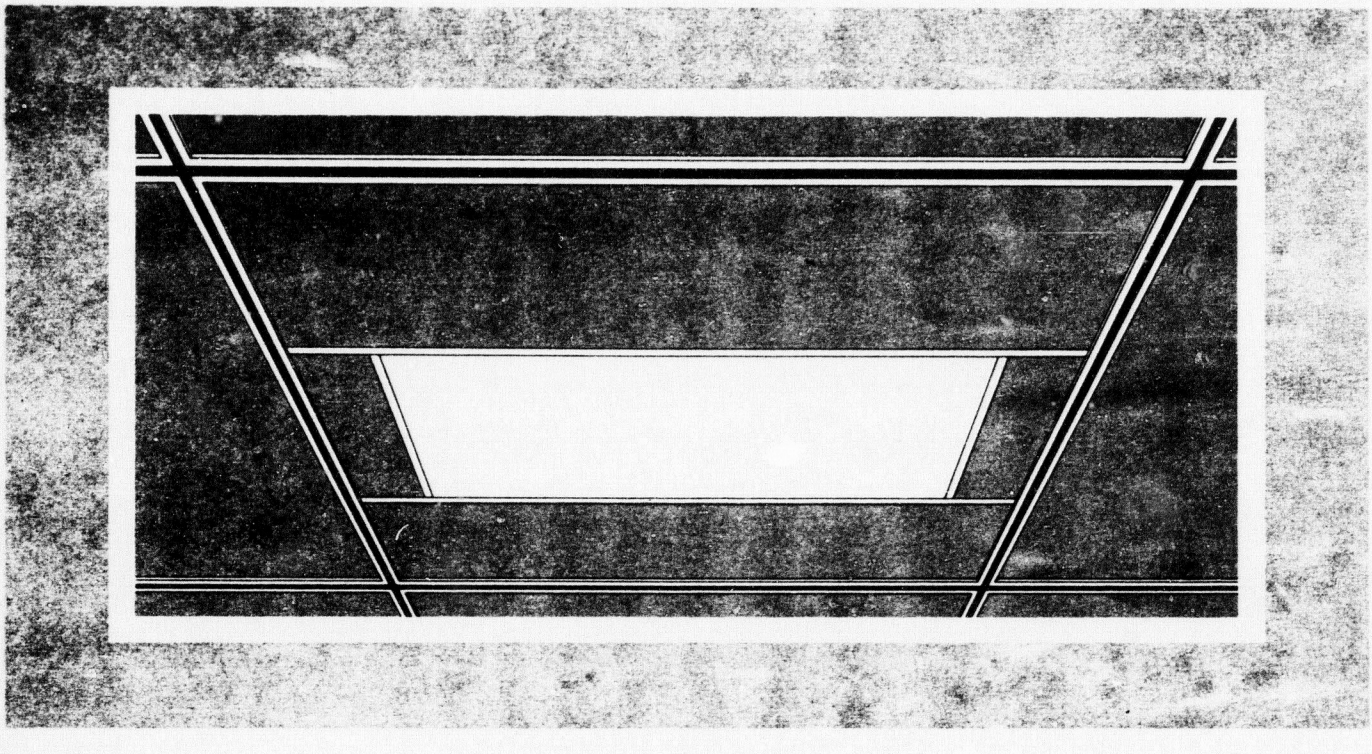


VARI-TEC 860 CEILING SYSTEM TIME-RATED SYSTEM (UL Design D213, 2 Hour) Noise Reduction Coefficients										
ACOUSTICAL PRODUCT	MODULE	LIGHT FIXTURE	Mounting	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	NRC Range
5/8" Protectone® N-D Perforated Stippled	60" x 60"	See NOTE below	X-30"	.43	.38	.48	.56	.58	.45	.45-.55

VARI-TEC 860 Normalized Attenuation Factors																			
ACOUSTICAL PRODUCT	MODULE	LIGHT FIXTURE	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	STC Range
5/8" Protectone N-D Perforated Stippled	60" x 60"	See NOTE below	25	35	36	33	32	33	34	38	39	40	42	44	44	48	51	56	40-44

CLASS 25 VARI-TEC Ceiling System Noise Reduction Coefficient										
ACOUSTICAL PRODUCT	MODULE	LIGHT FIXTURE	Mounting	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	NRC Range
5/8" Protectone Appointone	60" x 60"	See NOTE below	X-30"	.55	.55	.59	.61	.67	.59	.55-.65

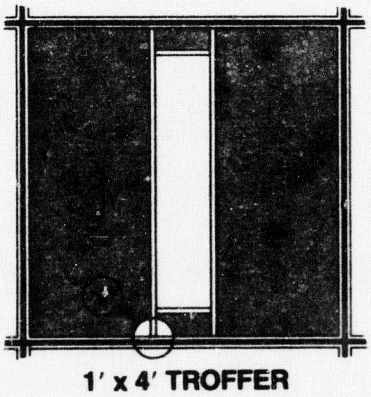
NOTE: [illegible] and STC values are predicated on use of 30" fixtures, one to each module. These values are improved with use of 24" fixtures and are reduced slightly when use of 10" fixtures



Vari-Tec 860 Flat Module Ceiling System With Standard Troffers

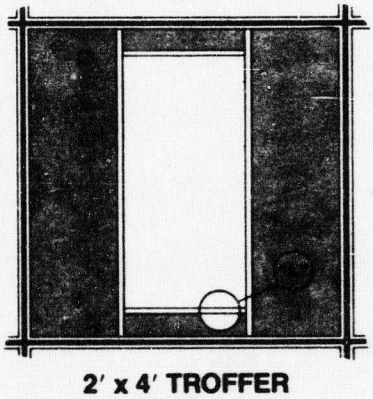
EYE-APPEAL AND DEPENDABLE PERFORMANCE WITH ECONOMY

This flat ceiling assembly, accommodating standard lighting fixtures, answers the requirement of projects with space limitations and /or budget considerations that will not permit a coffered-type or vaulted ceiling construction. An excellent choice for multi-story buildings, schools, offices, other large-area projects. The Vari-Tec 860 Flat Module Ceiling System provides modular definition, flexibility of lighting fixtures, acoustical control, air distribution, and controlled lighting.



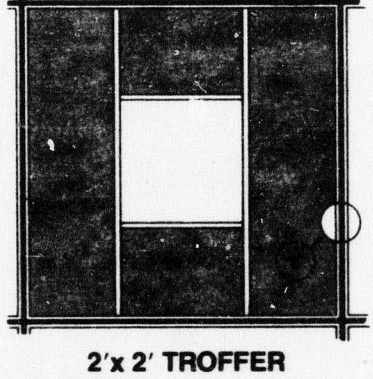
1′ x 4′ TROFFER

Vari-Tec 860 with 1′ x 4′ fluorescent troffer supported by flat cross tee (custom-fitted), with bordering Vari-Tec acoustical panels.



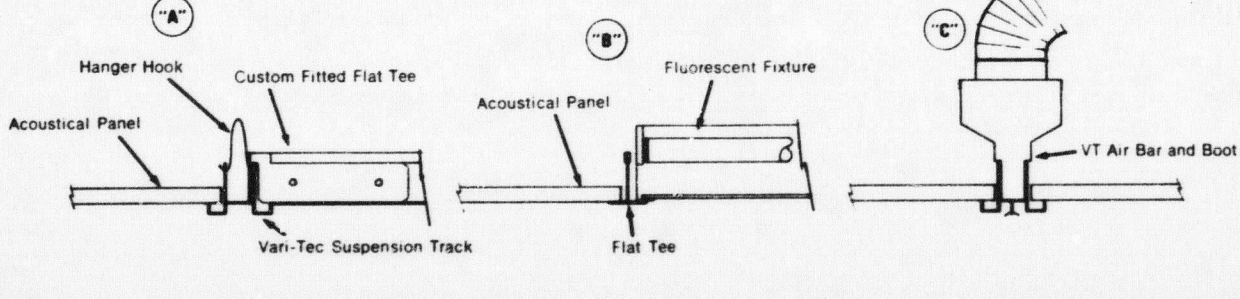
2′ x 4′ TROFFER

Vari-Tec 860 with 2′ x 4′ fluorescent troffer supported by flat cross tee (custom-fitted), with bordering Vari-Tec acoustical panels.

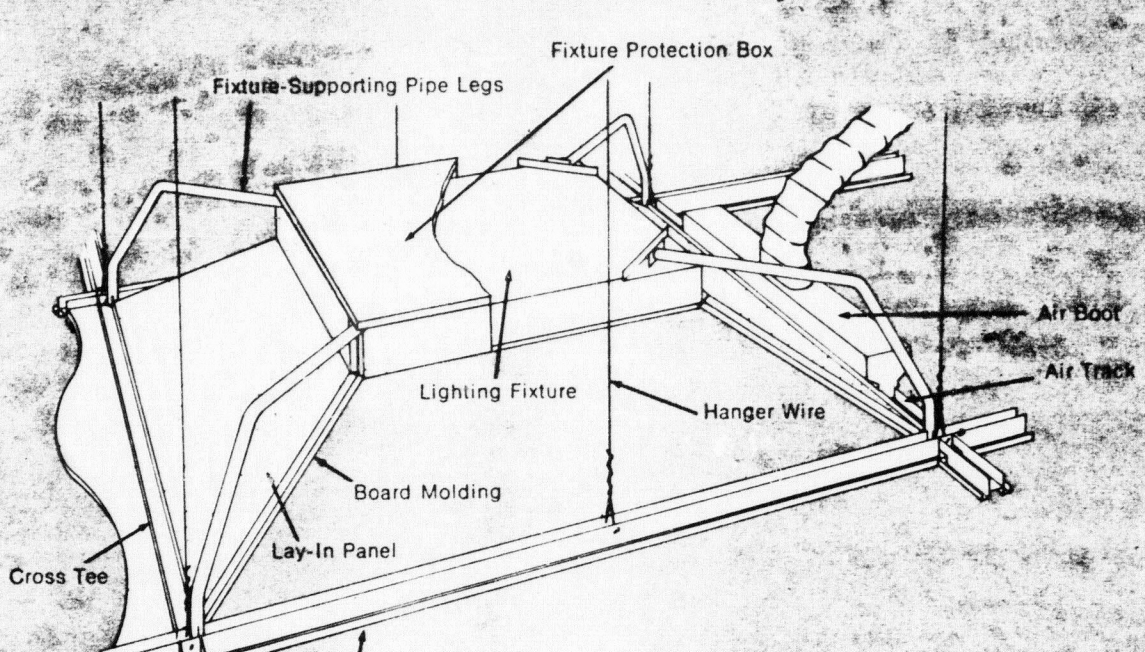


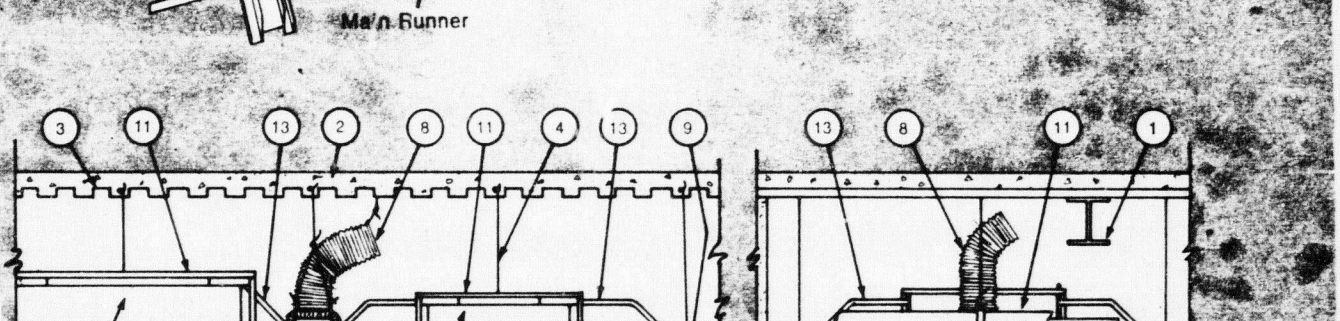
2′x 2′ TROFFER

Vari-Tec 860 with 2′ x 2′ fluorescent troffer supported by flat cross tee (custom-fitted), with bordering Vari-Tec acoustical panels.



Vari-Tec 860 Time Rated Assembly





1. Minimum 8" Steel Beam
2. 2½" Concrete
3. Steel Floor Units. All 18 MSG min. fluted All 20/20 MSG cellular or Any blend of fluted and Cellular units.
4. Hanger Wire – No. 14 SWG Steel wire spaced 30" o.c.
5. Vari-Tec 800 Suspension Members.
6. Vari-Tec 800 [illegible]-Tee.
7. Insulated Vari-Tec Air Spot.
8. 5" Dia. Flexible Duct, Class 0 or Class 1.
9. Hanger Clip.
10. Vari-Tec Wall Moulding.
11. Fixture protection.
12. Vari-Tec 800 Light Fixture.
13. Vari-Tec Module Support.
14. Approved Barrier Type [illegible]

TECHNICAL DATA

Module Size: 5'-0" x 5"-0"

PARTITION SUPPORT: On Module Lines in either direction.

Air Supply: Linear air diffuser on module line. 0-33 cfm. ft. sir capacity. Directional vanes control volume supplied, adjust from horizontal to vertical throw. Supply through individual volume dampered boots.

Air Return: Each fixture type is designed with effective heat extraction properties.

Lighting: Fluorescent fixture with integral heat extraction.

Acoustical Control: Coffered [illegible] tone Vari-Tec 860 mineral fiber ceiling panels under U.L. Design D312 2 hour. Panels Provide [illegible] 40-44.

Suspension: All steel with baked enamel finish.

Approvals: Lighting Fixture is [illegible] and UL listed. Ceiling panels meet the requirements of Fed. Spec. SS-S-118a, Class 25; UL Class A, ASTM E119 UL classified for time-rated as

NOTE: For Time-rated system Sound Absorption Coefficients and Attenuation [illegible] Table, page 28.

Vari-Tec 860
Architectural Specifications

SCOPE:

The work of this section shall consist of the furnishing of all labor, material equipment, and services necessary for the installation of all Environmental Ceilings as shown in the drawings (Sheets No) and as specified.

GENERAL:

Related work specified elsewhere:

A. The furnishing and installation of duct work up to and including the termination fittings for the attachment of flexible air tubes.

B. All electrical work, except the installation and connection of the lighting fixtures as furnished in this specification, to branch circuit wiring terminated in a junction box above the fixture or group of fixtures.

MATERIALS:

A. Suspension System. This suspension system shall be the Celotex Corporation Vari-Tec 800 Track Suspension System. The grid shall be fabricated of 24 gauge cold rolled, phosphatized steel with baked enamel matte finish. It shall be 2½" wide and 1½" high. All exposed surfaces shall be matte white finish except the 1" wide x ½" deep reveal on the center axis which shall be matte black finish. The five-foot cross tees shall snap-lock securely on to the center rail of the main runners. The wall moulding shall receive either the main track or cross tees on 60" centers without special punching. The main track shall be pre-punched 6" on center to accept cross tees.

B. Acoustical Panels: The Acoustical panels shall be Safetone Vari-Tec 860 Mineral Fiber Panels as manufactured by The Celotex Corporation. Panels shall meet the requirements of Federal Specification SS-S-118a, Class 25. The material shall also be classified by Underwriters' Laboratories, Inc., under Hazard Classification for a Flame Spread of 0-25. The material shall have a factory-applied washable white finish and a minimum light reflection of .80.

C. Light Fixture: Fixtures shall be the Celotex Vari-Tec 860 Unit compatible only with the Vari-Tec 800 Track System. The fixture shall be a recessed troffer type (2' x 2') (3' x 3') (Linear Vari-Tec) (Cat. No.) as indicated on the Fixture Schedule. Each fixture shall be of the direct type, having photometric and VCP data, obtained from ITL, on the fixture and lens tested in a coffer.

The fixture housing shall be fabricated to be compatible with Vari-Tec fixture supports and provide support for Vari-Tec ceiling board materials. All steel parts of the fixture shall be furnished in baked white enamel with a light reflectance of not less than 85%.

The fixture shall be designed for air return by means of openings in the top of the fixture housing, permitting air to pass across the lamps and ballast chamber, carrying heat out of the occupied areas to the plenum.

The fixture shall have fluorescent lamps of the type and number indicated on the drawings and listed in the Fixture Schedule.

Ballast shall be of the high-power-factor type, meeting the Certified Ballast Manufacturer's standards as certified by ETL, and carrying a U.L. Class P label. Fixtures shall have U.L. recessed fixture label. Fixtures shall be installed in each coffered module of the Vari-Tec 860 Ceiling System, as indicated on the drawings.

For Vari-Tec 860 Flat Module use this instead of preceding.

C. Light Fixture: The light fixtures shall be a recessed troffer type (1' x 4'), (2' x 2'), (2' x 4'), (Cat. No.), as indicated on the Fixture Schedule.

Fixtures shall be supported within the Vari-Tec 860 module by specially designed tees, which can be securely locked to the Vari-Tec 800 Track Suspension System.

D. Lens: Lens shall be prismatic, of 100% virgin acrylic resins, designed as Vari-Tec 860 Ceiling System diffuser. Lenses shall be heavy duty extruded aluminum framed, gasketed, and removable for easy access to lamps, ballast and wiring.

E. Supply Air Boot: Supply air boot shall be The Celotex Vari-Tec 800 Supply Air Boot constructed of 24 Ga. steel with galvanneal finish. The duct inlet connections shall be (5") or (6") with a built-in volume control and deflecting damper. The damper shall be adjustable from the room space through the air track slot without removing any system components. Duct connections shall be centered on the air boot.

F. Air Track: Air track shall be the Celotex Vari-Tec 800 Supply Air Track with fully adjustable air deflectors for air discharge in one or two directions. The air deflectors shall be painted matte black to match the center reveal of the track. The air track shall conform to system specifications regarding over-all width and finish.

INSTALLATION:

A. Suspension System: The Celotex Corporation Systems Contractor shall furnish and install the Celotex Vari-Tec 800 Track Suspension System. The system shall be installed in accordance with the drawings, and in accord with the manufacturer's recommendations. The suspension system shall be supported by #12 Ga. wires placed on 30" on center along the main runner.

B. Air Bar and Air Boot: This work shall include furnishing and installing Celotex Vari-Tec 800 Supply Air Track Units as indicated on the plans. (Each unit shall consist of one Supply Air Boot and one air track.)

C. Light Fixtures: This work shall include the installation of fixtures, wiring to the feed junction boxes, and fixture-to-fixture wiring, as indicated on the plans.

D. Acoustical Panel: The Celotex Ceiling Systems Contractor shall furnish and install the Vari-Tec 860 ceiling panels as specified or designated by the drawings. The panels shall be installed in strict accord with manufacturer's recommendations in order to provide a satisfactory installation.

E. Cleaning: Following installation, soiled or discolored surfaces of the system should be cleaned. Damaged or improperly installed units shall be removed and replaced.

SPECIAL CONDITIONS

When system is installed as "floating ceiling," main runners must be used as perimeter. All perimeter corners of main runners must be field miter-cut, and a perimeter corner connector pop-riveted to runners to hold sections in alignment. Outside and inside corner caps are snapped over flange of grid members and secured in place by bending tabs over outside edge of each flange.

Celotex

Vari-Tec 860 Time Rated
Architectural Specifications

(UL Floor and Ceiling Design No. D213 – 2 Hour Restrained or Unrestrained – 2 Hour Beam)

SCOPE:

The work of this section shall consist of the furnishing of all labor, material, equipment, and services necessary for the installation of all Environmental Ceilings as shown in the drawings (Sheets No.) and as specified.

GENERAL:

Related work specified elsewhere:

A. The furnishing and installation of duct work up to and including the termination fittings for the attachment of flexible air tubes.

B. All electrical work, except the installation and connection of the lighting fixtures as furnished in this specification, to branch circuit wiring terminated in a junction box above the fixture or group of fixtures.

MATERIALS:

A. Suspension System: The suspension system shall be the Celotex Corporation Vari-Tec 800 Track Suspension System. The grid shall be fabricated of 24 gauge cold rolled, phosphatized steel with baked enamel matte finish. It shall be 2½" wide and 1½" high. All exposed surfaces shall be matte white finish except the 1" wide x ½" deep reveal on the center axis which shall be matte black finish. The five-foot cross tees shall be snapped securely on to the center rail of the main runners and locked into position. The wall moulding shall receive either the main track or cross track on 60" centers without special punching. The main track shall be pre-punched 6" on center to accept cross tees. Components shall be UL classified for use in Floor and Ceiling Design No. D213.

B. Acoustical Panels: The acoustical panels shall be Vari-Tec 860 Protectone N-D Perforated Stippled Mineral Fiber Panels as manufactured by The Celotex Corporation. Panels shall meet the requirements of Federal Specification SS-S-118a, Class 25. The material shall also be classified by Underwriters' Laboratories, Inc., under Hazard Classification for a Flame Spread of 0.25, and for use in Floor and Ceiling Design No. D213. The material shall have a factory-applied washable white finish and a minimum light reflection of .80.

C. Light Fixture: Fixtures shall be the Celotex Vari-Tec 860 Unit compatible only with the Vari-Tec 800 Track System. The fixture shall be a recessed troffer type (2' x 2') (3' x 3') (Cat. No.) as indicated on the Fixture Schedule. Each fixture shall be of the direct type, having photometric and VCP data, obtained from ITL, on the fixture and lens tested in a coffer.

The fixture housing shall be fabricated to be compatible with Vari-Tec fixture supports and provide support for Vari-Tec ceiling board materials. All steel parts of the fixture shall be furnished in baked white enamel with a light reflectance of not less than 85%.

The fixture shall be designed for air return by means of openings in the top of the fixture housing, permitting air to pass across the lamps and ballast chamber, carrying heat out of the occupied areas to the plenum.

The fixture shall have fluorescent lamps of the type and number indicated on the drawings and listed in the Fixture Schedule.

Ballast shall be of the high-power-factor type, meeting the Certified Ballast Manufacturer's standards as certified by ETL, and carrying a U.L. Class P label. Fixtures shall have U.L. recessed fixture label. Fixtures shall be installed in each coffered module of the Vari-Tec 860 Ceiling System, as indicated on the drawings.

D. Lens: Lens shall be prismatic, of 100% virgin acrylic resins, designed as Vari-Tec 800 Ceiling System diffuser. Lenses shall be heavy duty extruded aluminum framed, gasketed, and removable for easy access to lamps, ballast and wiring.

E. Supply Air Boot: Supply air boot shall be The Celotex Vari-Tec 800 Supply Air Boot constructed of 24 Ga. steel with galvanneal finish. The duct inlet connections shall be (5" oval) with a built-in volume control and deflecting damper. The damper shall be adjustable from the room space through the air track slot without removing any system components. Duct connections shall be centered on the air boot. Air boot shall be UL classified for use in Floor and Ceiling Design No. D213.

F. Air Track: Air track shall be the Celotex Vari-Tec 800 Supply Air Track with fully adjustable air deflectors for air discharge in one or two directions. The air deflectors shall be painted matte black to match the center reveal of the track. The air track shall conform to system specifications regarding over-all width and finish. Air track shall be UL classified for use in Floor and Ceiling Design No. D213.

INSTALLATION:

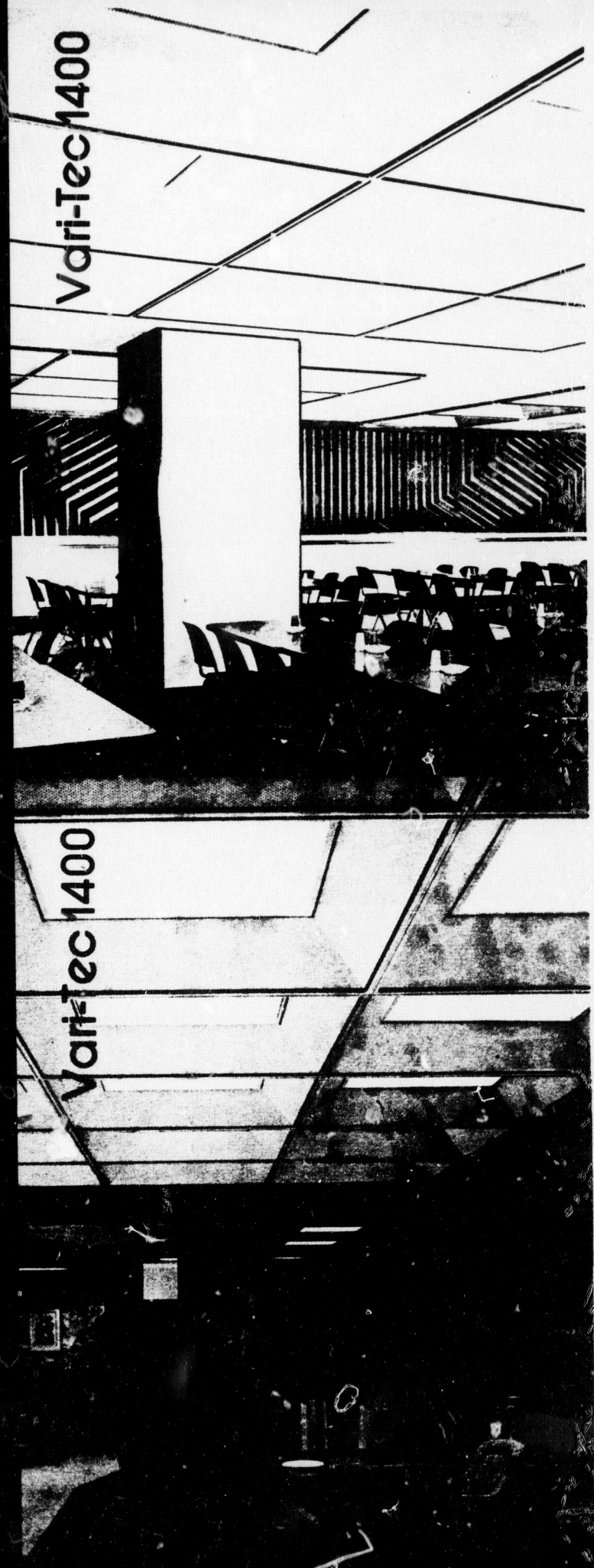
A. Suspension System: The Celotex Corporation Systems Contractor shall furnish and install the Celotex Vari-Tec 800 Track Suspension System. The system shall be installed in accordance with the drawings, and in accord with the manufacturer's recommendations, to obtain time-rating specified. The suspension system shall be supported by #12 Ga. wires placed 30" on center along the main runner and cross tees.

B. Air Bar and Air Boot: This work shall include furnishing and installing Celotex Vari-Tec 800 Supply Air Track Units as indicated on the plans to obtain time-rating specified. (Each unit shall consist of one Supply Air Boot and one air track.)

C. Light Fixtures: This work shall include the installation of fixtures, wiring to the feed junction boxes, and fixture-to-fixture wiring, as indicated on the plans.

D. Acoustical Panel: The Celotex Ceiling Systems Contractor shall furnish and install the Vari-Tec 860 Protectone N-D Perforated Stippled ceiling panels as specified or designated by the drawings. The panels shall be installed in strict accord with manufacturer's recommendations in order to provide a satisfactory installation and to obtain time-rating specified.

E. Cleaning: Following installation, soiled or discolored surfaces of the system should be cleaned. Damaged or improperly installed units shall be removed and replaced.



Vari-Tec 1400 Ceiling System

The Vari-Tec is an advanced, essentially custom ceiling system. It offers maximum excellence in lighting, acoustics and air distribution. In addition, it permits flexibility in space partitioning for a completely comfortable environment. All parts are manufactured as related components that can be assembled easily in the field to complete a system as planned. The Vari-Tec 1400 system features further integration in interior design with its unique Partitionaire* track, which permits easy partition attachment in any direction, without necessitating removal or modification of the air track, and offers a custom linear ducted air supply.

TECHNICAL DATA

Module Sizes:
5'-0" x 5'-0". Custom sizes available.

Lateral Partition Support:
On module lines in either direction.

Air Supply:
Linear air track on module lines 0-50 cfm/ft. air capacity without interfering with partition support.

Air Return:
Return air is removed from space through heat extraction lighting troffer.

Lighting:
2' x 2' and 3' x 3' troffers with custom aluminum framed acrylic lens, varied lens types.

Acoustical Control:
Acousteel* metal coffers with mineral fiber backing. NRC range: .55-.65. STC range: 40-44.

Suspension:
Extruded aluminum members with enamel finish.

Approvals:
Lighting fixture is IBEW labeled and UL listed. Ceiling panels meet requirements of Fed. Spec. SS-S-118a, Class 25.

*Reg. U.S. Pat. Off.

Celotex



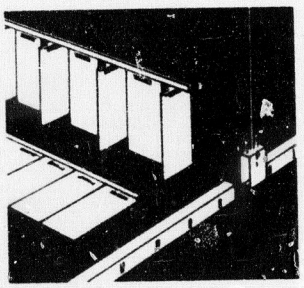
The Leaf-Lite Ceiling

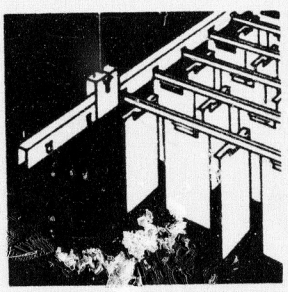
The Celotex® Leaf-Lite ceiling – a sublime concept of colo pattern-texture. Basically a ceiling comprising three parts: Lea channel (with leaves), Hanger channel, and Hanger bracke Much of the richness in pattern comes from the multiplicity c pieces, yet installation is easy.

Leaf channels with leaves are shipped flat. They are hung a ro at a time in self-indexing slots. Then alternate leaves are turne to lock tight and square; they do not dislodge or rattle. Leave can be turned flat again for cleaning. No four-cornered cells t scrub.

Standard leaves are 3" x 6", aluminum painted white. (Chec with your Celotex Representative about other colors.) Lea channels are spaced 3" on centers and span 4' between th main hanger channels of steel, baked white enamel. Weight 3 lbs. per sq. ft.

For sheer drama – the Leaf-Lite Ceiling.





Manufactured under U.S. Patent Numbers 2870883, 300601 D182991, 3088025 and others pending. Canadian Pate Number 644,156. Leaf-Lite is a trade-mark of the Celotex Co poration.

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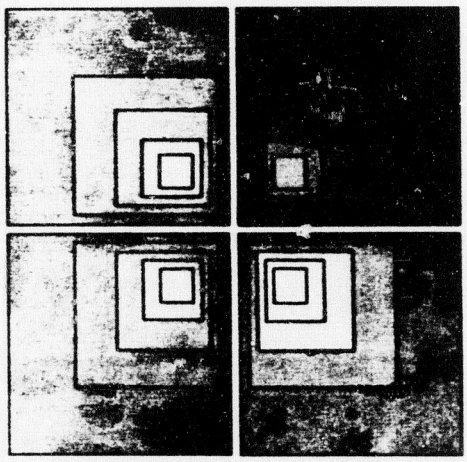
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††For further information on acoustical products and environmental ceiling systems described in this brochure, contact these Offices.



BUILDING PRODUCTS

†Acoustical Ceiling Systems & Products
  Tile & Lay-in Panels
†Built-Up Roofing Systems & Products
  Asphalt, Pitch
  Saturated Felts & Coated Sheets
†Expansion Joint Shields
  Flashings & Drains
  Cold-Applied Roofing Sheet & Adhesive
Carpeting, Residential
Concrete Expansion Joint Fillers
Garage Doors & Operators
Gypsum Drywall Systems & Products
  Gypsum Board
  Joint System Products
Hardboard Products
  Lap & Panel Siding
  Standard & Tempered Hardboard
  Underlayment
Insulating Fiberboard Products
  Ceiling Tile & Lay-in Panels
  Insulating Sheathing
  Sound Deadening Board
  Industrial Fiberboard
  Mobile Home Board
Insulation Products
  Glass Fiber Blankets
  Urethane Foam Boards
†Lighting for Ceilings
  Luminaire Environmental Systems
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  Prefinished Wood & Vinyl
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†Roof Insulations
  Urethane, Mineral & Fiberboard
†Roof Maintenance Systems
Roofing Shingles, Asphalt
Vinyl Building Products
  Siding, Soffits & Roof Edge
†Waterproofing & Dampproofing Products

†See Sweet's Files

Celotex®
BUILDING PRODUCTS

THE CELOTEX CORPORATION
TAMPA, FLORIDA 33622

a Jim Walter company

159 a

JACOBSON SUPPLY CENTER

SINCE 1889 — JACOBSON & COMPANY, INC. A DIVISION

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Elizabeth, N. J. 07201
(201) 355-5200

N.Y.C. - (212) 285-9840 • Phila. - (215) 567-6986

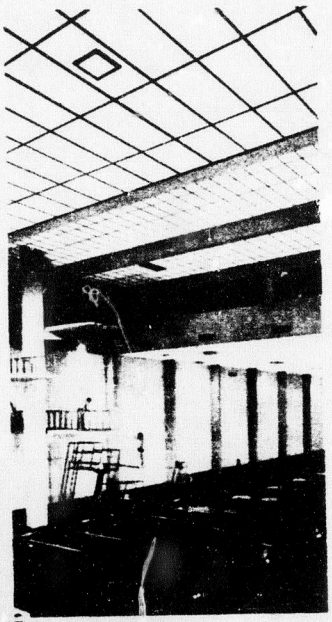
SUPPLIERS OF

Ceilings-Floors-Partitions

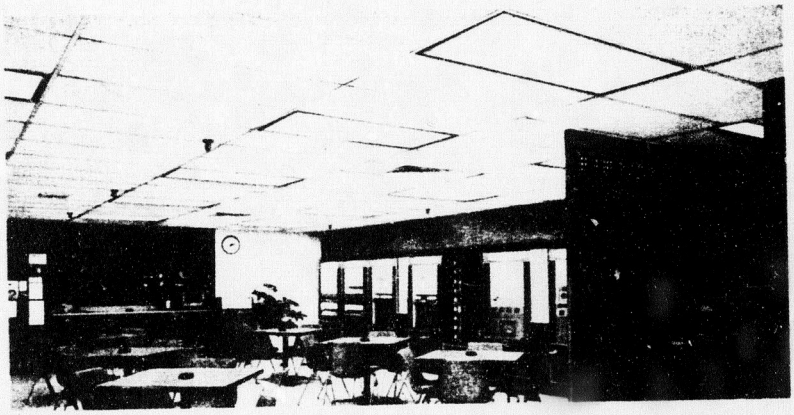
About the cover . . .

On the cover and throughout the brochure is a design which graphically represents the variety of sizes available in the Conwed ceiling products family.

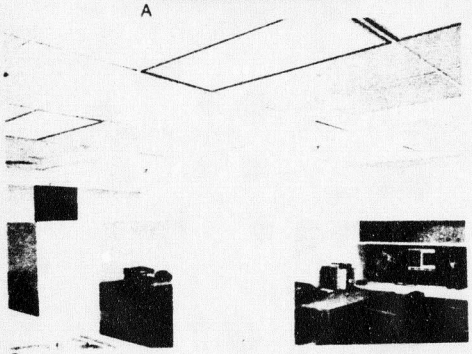
160 a



B



A



C



D



E



F

A. Regency ceiling
B. Ceramic ceiling
C. Regency ceiling
D. Rock Face (Reveal) ceiling
E. Natural Fissured ceiling
F. 1201 Air Bar

The performance data herein reflects Conwed's expectation based on tests conducted in accordance with ASTM, ABPA, and other recognized standard methods.

By presentation of this data, Conwed makes no express warranties concerning the characteristics, properties, availability or performance of these products, and specifically disclaims any implied warranties. This includes any warranty of merchantability or fitness for any particular purpose.

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Conwed

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TO SAVE YOU TIME . . .

A comparative product listing appears on page 3, providing sizes, shapes, fire ratings, and performance characteristics of each pattern.

For each specialty product, a graphic reminder of size availability is located at the top of the right hand page. All performance data and exact size information is detailed in a summary chart on the same page.

The standard and fire-rated sections include their own acoustical data summary charts as well as applicable suspension information. The fire-rated section also includes a fire hazard chart and a time design assembly rating chart — each designed to provide complete fire test information by product pattern.

ABOUT CONWED

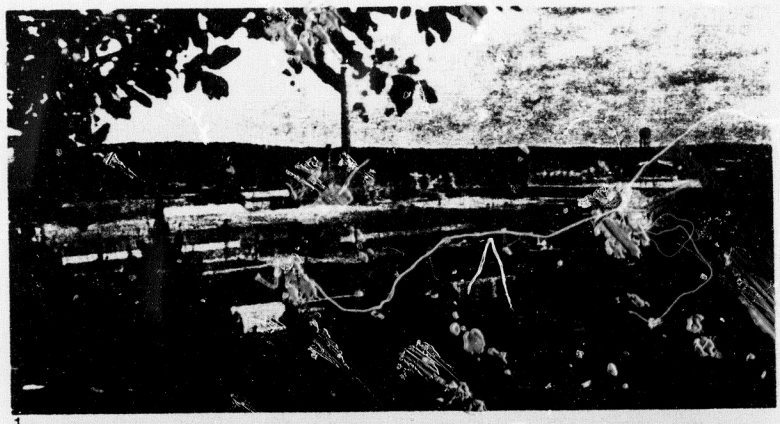
Conwed has served the construction industry for over 50 years including 20 years of design engineering, and manufacturing experience specifically directed to architectural ceiling products and systems. Today, the Conwed plant is the world's largest single manufacturing facility of mineral ceilings. Consistent raw material supplies are assured by the company's own mineral fiber operation. Conwed is also the foremost international supplier for mineral ceiling products.

In addition to ceilings, Conwed produces products and services for several markets. Some are directly related to commercial construction such as space dividers and modular work stations for open office planning, acoustical sound absorbers, and office furniture. Others, like Hydro-Mulch® fibers, are produced for rapid hydraulic mulching and turf establishment around buildings, along highways and in strip mine reclamation projects.

The same acoustical technology Conwed applies to ceilings has also made the company a major supplier of sound and vibration control products to the automotive industry.

Today, Conwed Corporation employs approximately 2000 people in seven manufacturing plants throughout the United States. An extensive ceiling products warehousing and architectural service organization assures efficient distribution, availability, and assistance at the local level.

While Conwed takes pride in its ceiling product innovations and product quality, it is most proud of its ability to support new ideas that meet the environmental challenges of today's construction industry.



1



2



3



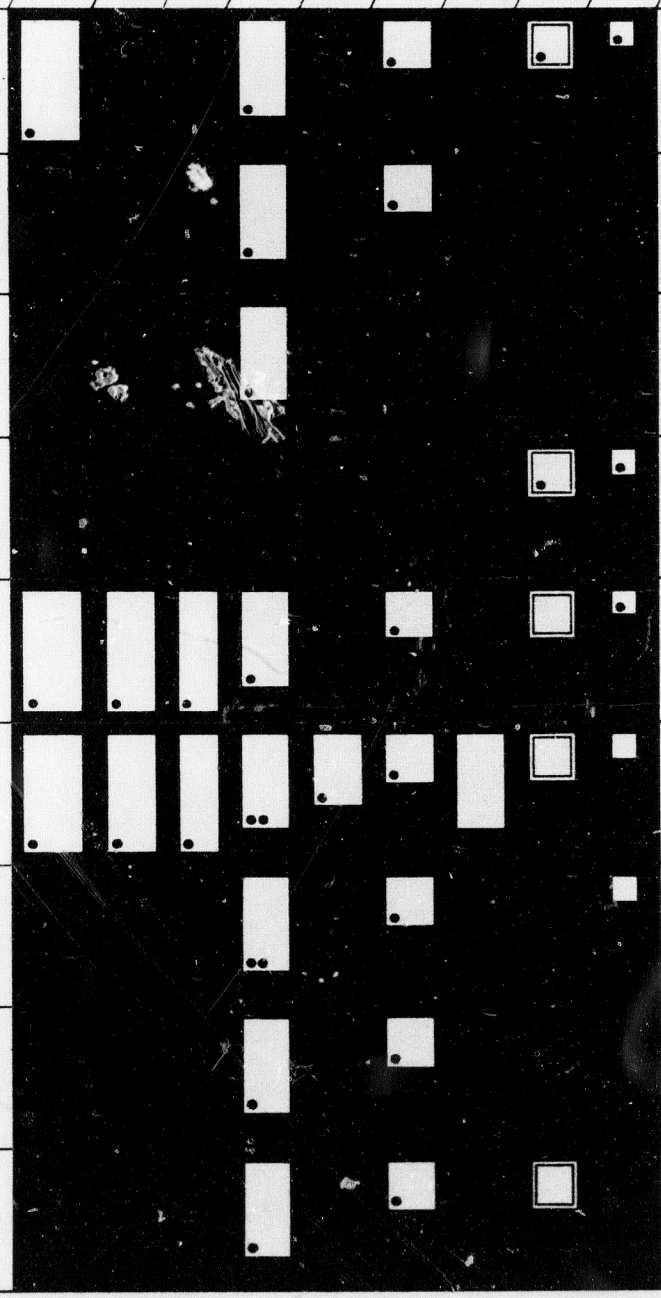
4

1. Cloquet manufacturing plant.
2. Maintaining quality controls.
3. Producing mineral fibers at Red Wing.
4. Testing and research.

163 a 9.1/Co

product features

Conwed



	LAY-IN PANELS							TILE		acoustics	abuse resistance	washability	humidity resistance	
	30" x 60"	24" x 60"	20" x 60"	24" x 48"	24" x 36"	24" x 24"	24" x 48" Semi-Concealed	24" x 24" Reveal	12" x 12"					
Rock Face	●			●		●		●	●	∴	∴	*	∴	
Ceramic				●		●				∴	∴	∴	∴	
Metal Face				●						∴	∴	∴	∴	
Natural Fissured								●	●	∴	∴	∴	∴	
Regency	●	●	●	●		●		●	●	∴	∴	∴	∴	
Fissura	●	●	●	●●	●	●	●	●	●	∴	∴	∴	∴	
Constellation II				●●		●			●	∴	∴	∴	∴	
Pebbled				●		●				∴	∴	∴	∴	
Celestial				●		●		●		∴	∴	∴	∴	

● Also available Fire-Rated

● Also available Vinyl-Coated

∴ excellent

∴ very good

∴ good

*Cleaned with a vacuum cleaner hose attachment



oject: "Indianapolis 500" Hospitality Suites, Indianapolis, Indiana

oduct: Conwed 24"x24" Rock Face reveal, Conwed 580 Series exposed grid.

chitect: Fine, Roberts & Petric, Inc., Engineers

oustical ntractor: Perry Acoustics



oject: Shreveport Regional Airport, Shreveport, Louisiana

oduct: Conwed 12"x12" Rock Face tile

chitect: Weiner, Hill, Morgan and O'Neal

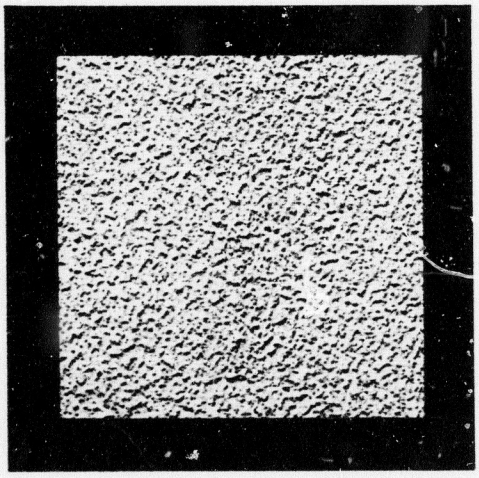
oustical ntractor: J. Tom Harrison, Inc.

Conwed

165 a

rock face™

CEILINGS



Introduced in 1969, Rock Face Ceilings now include ten sizes in tile, reveal edge tile, and lay-in panels. Rock Face appearance, performance and design versatility have established it as a leader in acoustical ceilings. In addition to abuse resistance its inherent qualities have made it a standard in design and low maintenance cost.

Abuse Resistance

The ultra-hard fused mineral surface resists bumps and scrapes and has a roughness which deters vandalism.

Appearance

The Rock Face surface looks so much like hand textured plaster that it is often specified to match plastered decorative domes and arches in ceilings.

Maintenance, Handling

The tough surface reduces damage during installation and plenum maintenance. Soiling during handling is also masked by the textured surface.

Particularly Desirable Interior Locations

Rock Face tile and reveal panels are ideal for high design areas — particularly where ceiling surfaces are illuminated by fixtures or natural light. Typical locations are lobbies, conference rooms, executive offices and galleries. The texture is attractive and masks soiling while resistant properties deter scuffs and scrapes.

Heavy traffic areas such as schools, airports and auditoriums benefit by Rock Face panel abuse resistance.

In low ceiling areas such as corridors and locker rooms the abuse resistant quality quickly pays for itself in reduced replacement cost.

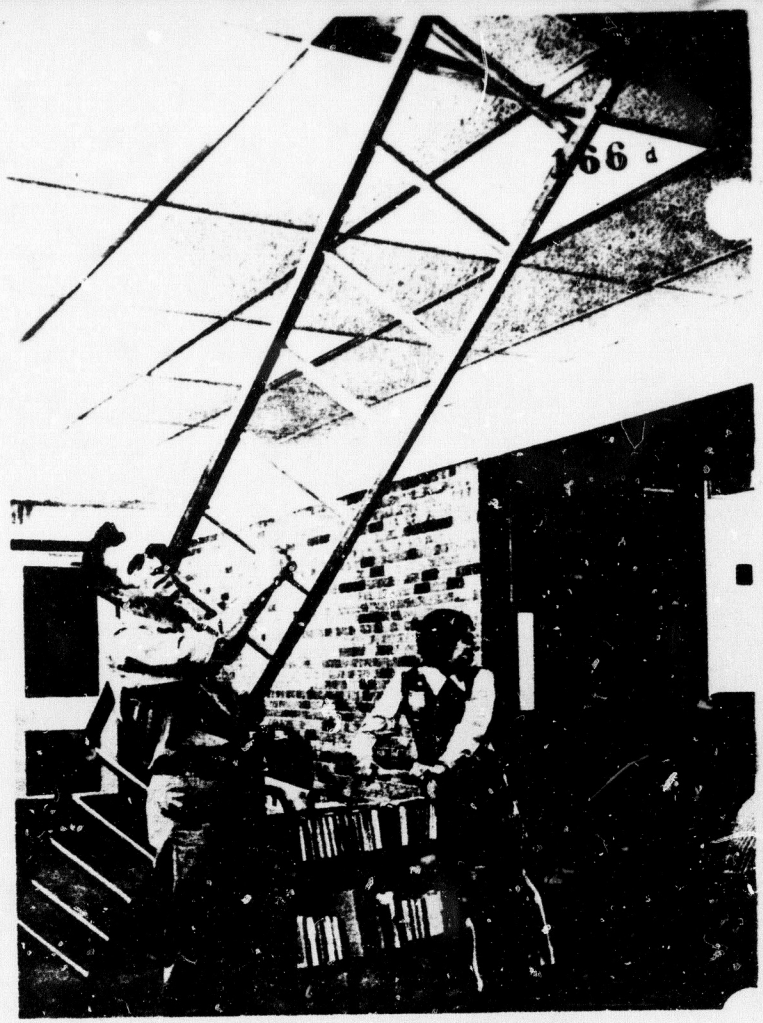
Renovation ceiling projects have become standard Rock Face installations for extended ceiling life and appearance.

Hospitals, laboratories, and industrial ceilings which demand ready plenum accessibility benefit from Rock Face panel durability. Panel breakage, edge chipping, and soiling during removal for access to piping, electrical and air handling lines are minimized.

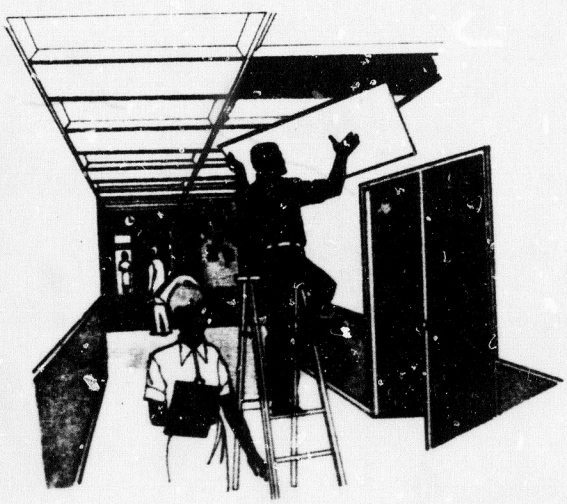
The case for abuse resistant ceilings in new installations and renovations.

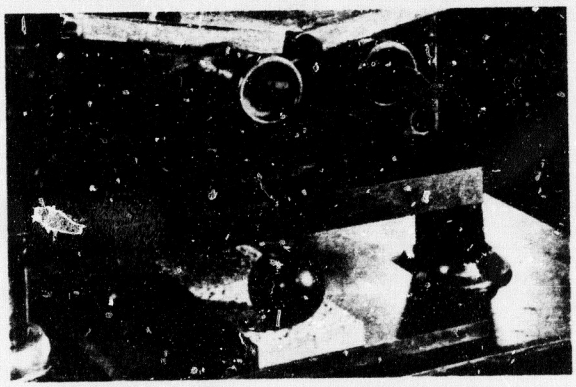
Rock Face Ceilings are the solution wherever abuse is a problem: in schools, hospitals, churches, recreation centers, and main lobbies. Ceilings do get bumped by mop handles or ladders . . . scuffed by jumping kids or flying books . . . cracked or chipped during routine plenum maintenance. Rock Face panels minimize the damage potential, providing long-term savings.

When ceilings are noticeably scraped or scuffed, they've taken some abuse. New ceilings will get the same rough treatment. Make sure they can take it.

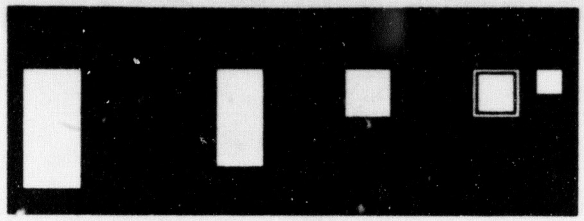








The hardness quality of the Rock Face surface is measured by the "ball hardness test." Rock Face tolerated an average resistance to surface deformation of 150 pounds using a 2 inch steel sphere. (ASTM C-637)



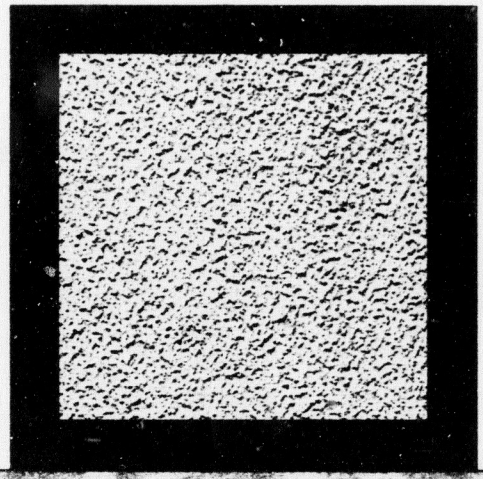
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Conwed

rock face

167 a

CEILINGS

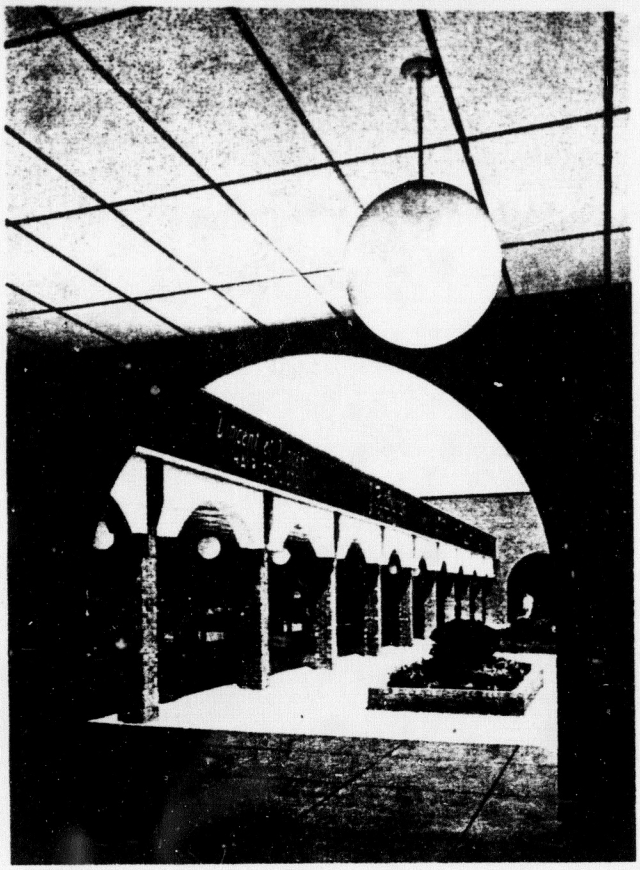


DATA SUMMARY CHART — ROCK FACE

	Product Number	Size*	STC Range	NRC Range	Light Reflectance	C Factor @ 75° F.	Compatible Grid System Series Number	Fire Hazard Class	Fire Resistant Hourly Rate Assembly**	Suggested Installation Area
STANDARD LAY-IN CEILING PANELS Square Edge	56330 56382 56365	5/8x24x24 5/8x24x48 5/8x30x60	35-39	.50-.60	LR1 (86%)	.627	500 800	25	—	
FIRE-RATED LAY-IN CEILING PANELS Square Edge	56336 56381 56385	5/8x24x24 5/8x24x48 5/8x30x60	35-39	.50-.60	LR1 (86%)	.733	550 850	25	¾, 1, 1½, 2, 3 Hour Ratings	
STANDARD CONCEALED TILE Butt K&R Beveled Edge	55375	¾x12x12	35-39	.50-.60	LR1 (86%)	.724	444	25		Lobbies Conference rooms Offices Galleries Corridors Locker rooms Laboratories Industrial areas
FIRE-RATED CONCEALED TILE Butt K & R Beveled Edge	55385	¾x12x12	35-39	.55-.65	LR1 (86%)	.767	450 455	25	1, 2, 3 Hour Ratings	
STANDARD REVEAL TILE Square-Rabbeted Reveal Edge	55378	¾x24x24	35-39	.50-.60	LR1 (86%)	.724	500 800	25	—	
FIRE-RATED REVEAL TILE Square-Rabbeted Reveal Edge	56383	¾x24x24	35-39	.50-.60	LR1 (86%)	.767	550 850	25	2 Hour Rating	

*Nominal size indicated

**See pages 18-23 for details



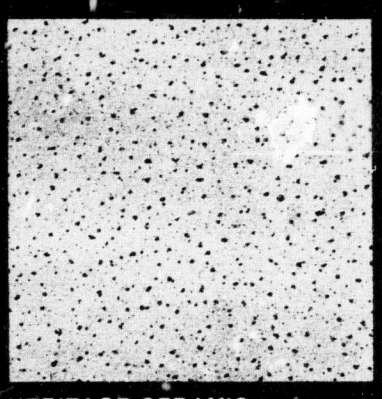
Project: Little River Turnpike Shopping Center, Annandale, Virginia
Product: Conwed 24"x48" Heritage Ceramic panels
Architect: Kohler-Misner-Daniels
Acoustical Contractor: Wayne Insulation Co.

Project: Regency Health Spa, Incorporated, Spartanburg, South Carolina
Product: Conwed 24"x24" Heritage Ceramic panels
Architect: Cecil Associates
Acoustical Contractor: Interior Construction



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ceramic
PRODUCTS



HERITAGE CERAMIC



NON-PERFORATED CERAMIC

Formulated for high humidity areas
Resists warping and sagging
Made from 100% inorganic mineral fibers in a ceramic bond

These fire-rated lay-in panels provide suspended ceilings that will not warp or sag under conditions of heat, humidity or corrosive chemical fumes.

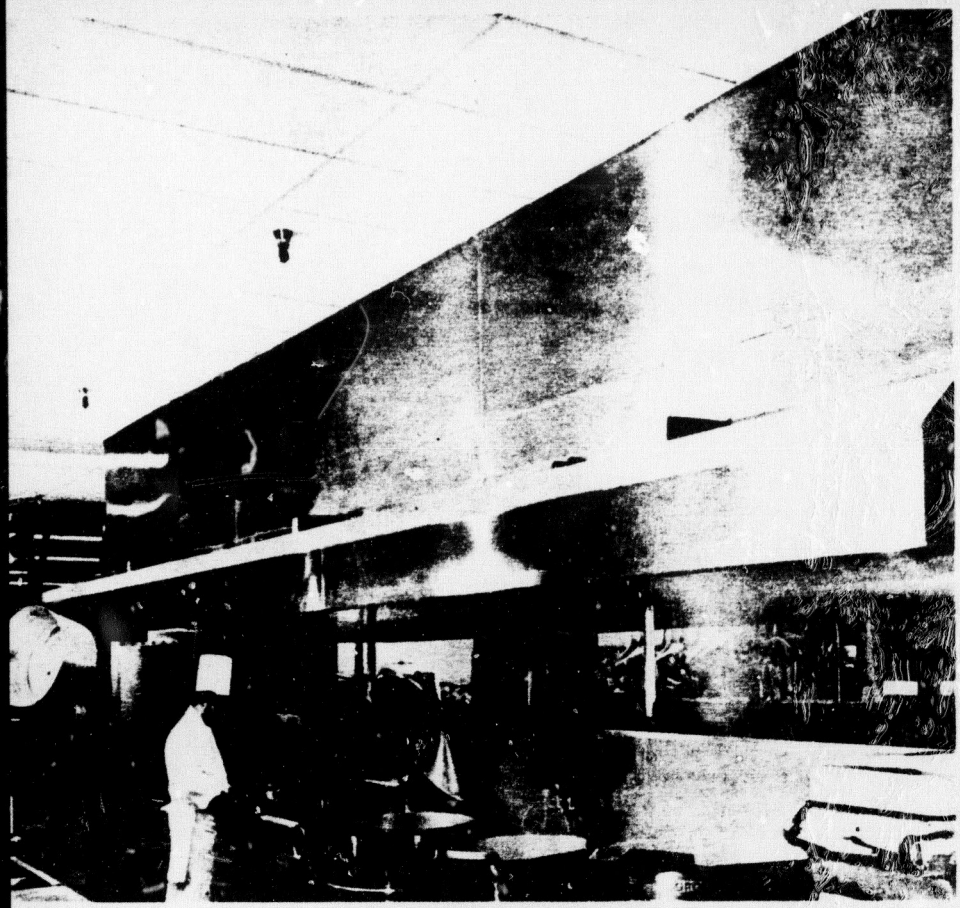
Conwed Ceramic panels combine an attractive appearance with sound reducing properties, and carry an exclusive Fire Hazard Rating of 0-0-0 (flame spread, fuel contributed, smoke developed).

DATA SUMMARY CHART — CERAMIC

	Product Number	Size*	STC Range	NRC Range	Light Reflectance	C Factor @ 75° F.	Compatible Grid System Series Number	Fire Hazard Class	Fire Resistant Hourly Rate Assembly**	Typical Installation Area
FIRE-RATED LAY-IN CEILING PANELS Heritage Pattern Square Edge	56644 56645	5/8x24x24 5/8x24x48	40-44	.50-.60	LR1 (86%)	.767	830	25	¾, 1, 1½, 2, 3 Hour Ratings	Indoors: Swimming pools Kitchens Industrial plants
FIRE-RATED LAY-IN CEILING PANELS Plain Square Edge	56646	5/8x24x48	40-44	—	LR1 (86%)	.767	830	25	¾, 1, 1½, 2, 3 Hour Ratings	Outdoors: Soffits and Canopies

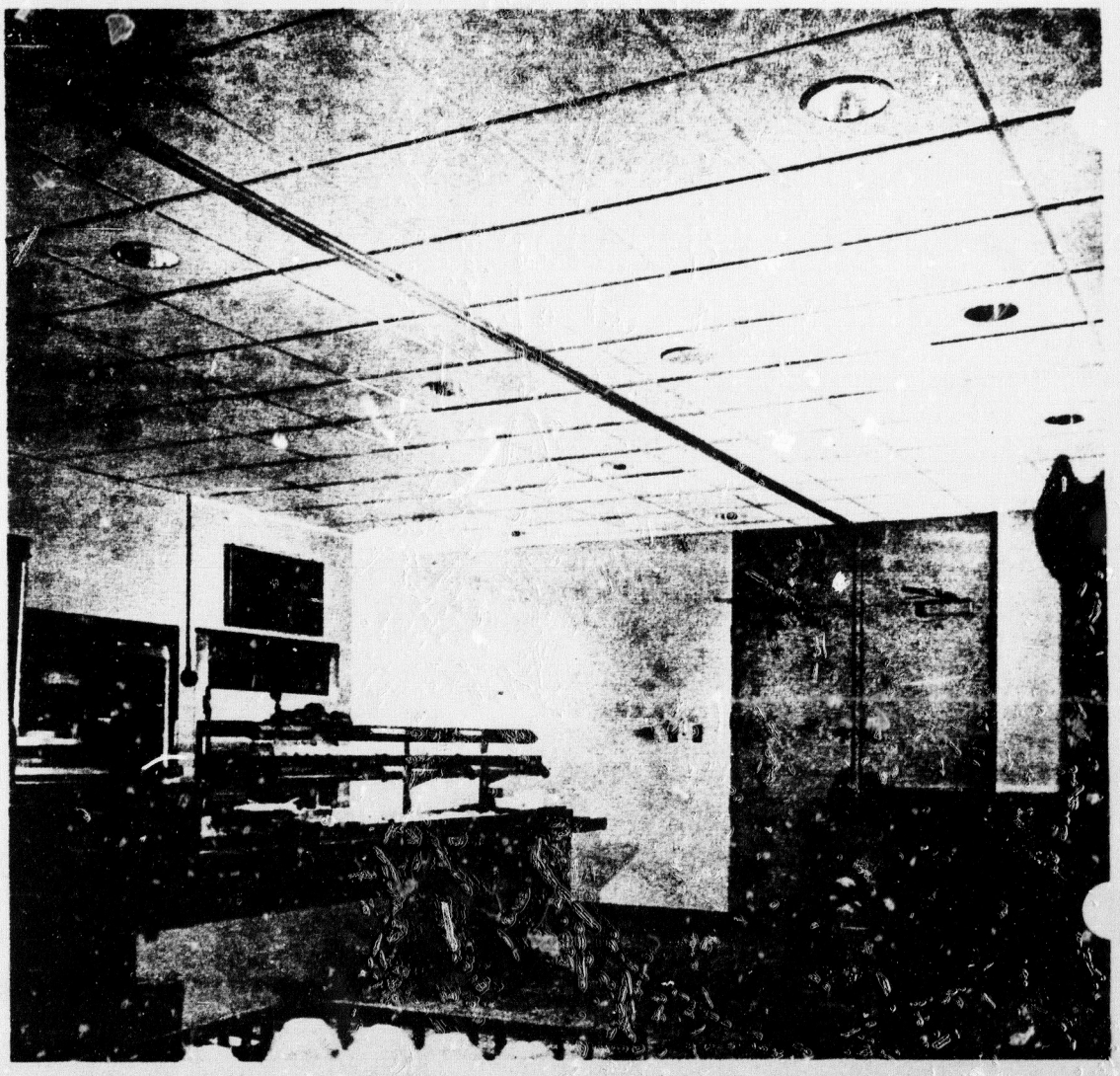
*Nominal size indicated

**See pages 18-23 for details



Project: United Air Lines Food Service, Los Angeles, California
Product: Conwed 24"x48" Metal Face panels
Architect: David T. Witherly Engineers
Acoustical Contractor: Wendel D. Tate, Co., Inc.

Project: Eastern Air Lines Computer Reservation Center, Iselin, New Jersey
Product: Conwed 24"x24" Metal Face panels
Architect: Frank Grad & Sons
Acoustical Contractor: Acoustics, Inc.

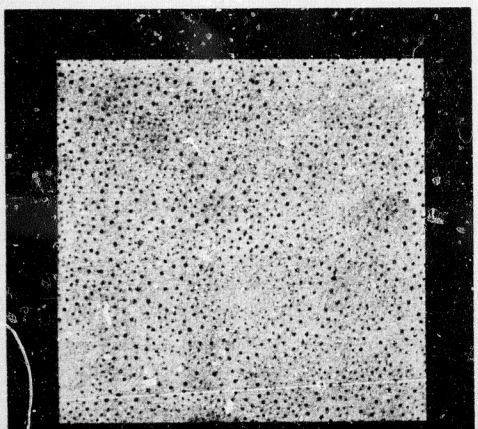


Conwed

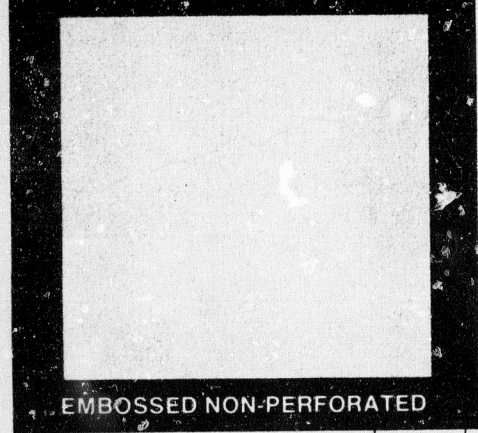
171 a

metal face

CEILINGS



EMBOSSED PERFORATED



EMBOSSED NON-PERFORATED

Durable metal surface
Vinyl-coated for scrubbability
Easy lay-in panel installation

Conwed Metal Face panels are engineered to resist dirt, dust, grease, and odor penetration, and permit effective surface cleaning.

Vinyl-coated embossed aluminum is bonded to the mineral fiber substrate resulting in an easily maintained, corrosion resistant, durable product. Grease and vapor concentrations can be wiped clean with a sponge and mild detergent solution. The Metal Face surface has actually withstood 5,000 cycles of the Gardner scrubbability test without sign of wear.

Metal Face ceilings combine metal surface durability and easy maintenance with lay-in panel installation and plenum access advantages. The panels can be cut with standard tools and installed in standard suspension systems. Often Metal Face panels are selected for replacement of metal pan ceilings.

Suggested Applications

Hospitals, laboratories, supermarkets and kitchens particularly require the qualities inherent in Metal Face panels. The panels look clean, attractive and are easily maintained.

DATA SUMMARY CHART — METAL FACE

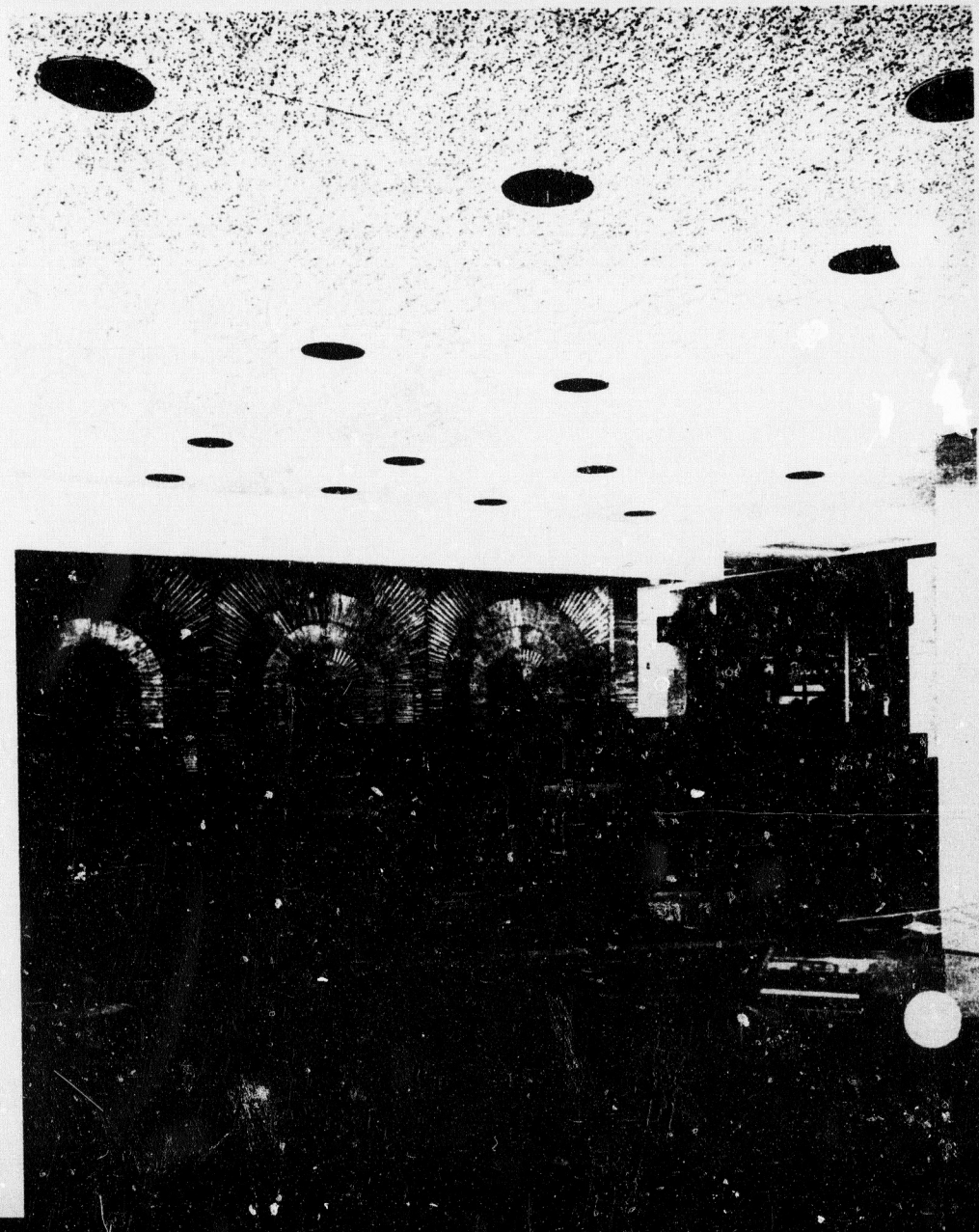
	Product Number	Size*	STC Range	NRC Range	Light Reflectance	C Factor @ 75° F.	Compatible Grid System Series Number	Fire Hazard Class	Fire Resistant Hourly Rate Assembly**	Typical Installation Area
STANDARD LAY-IN CEILING PANELS Embossed, plain Square Edge	56082	5/8x24x48	35-39	—	LR1 (89%)	.627	500 800	25	—	Hospitals Laboratories Supermarkets Kitchens
STANDARD LAY-IN CEILING PANELS Embossed Constellation Square Edge	56080	5/8x24x48	35-39	.55-.65	LR1 (89%)	.627	500 800	25	—	
FIRE-RATED LAY-IN CEILING PANELS Embossed, plain Square Edge	56094	5/8x24x48	35-39	—	LR1 (89%)	.627	550 850	25	3/4, 1, 1 1/2, 2, 3 Hour Ratings	
FIRE-RATED LAY-IN CEILING PANELS Embossed Constellation Square Edge	56096	5/8x24x48	35-39	.55-.65	LR1 (89%)	.627	550 850	25	3/4, 1, 1 1/2, 2, 3 Hour Ratings	

*Nominal size indicated

**See pages 18-23 for details



Project: Diamond Department Store, Metro Center Mall, Phoenix, Arizona
Product: Conwed 12"x12" Natural Fissured tile
Architect: Ralph Kilman and Associates
Acoustical Contractor: Curtis-White



Project: Northern Federal Savings and Loan Association, St. Paul, Minnesota
Product: Conwed 12"x12" Natural Fissured tile
Architect: Grover Diamond and Associates
Acoustical Contractor: Acoustics Associates



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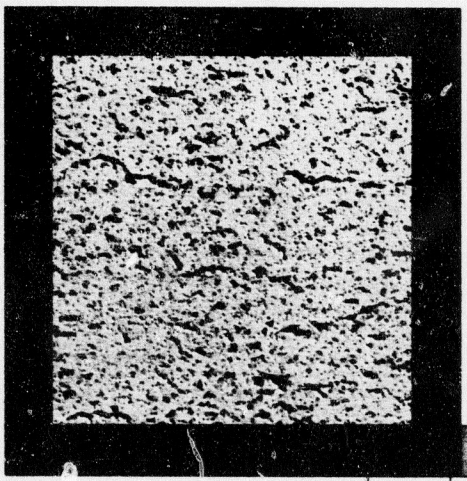
Conwed

173 a

natural fissured

CEILINGS

Deep natural fissured pattern
Good acoustical control . . . fire-rated
Wide choice of product sizes



The classic surface. Beautiful in concealed tile. Dramatic in 24"x24" reveal tile. These Natural Fissured ceiling products meet the most discriminating eye for fissured beauty.

Conwed's special manufacturing process adds an extra measure of dimensional stability and pattern consistency. No two tile look exactly alike but the variations are controlled, blending the pattern naturally.

Special Note: In addition to concealed ¾" tile Conwed offers a standard ⅝" tile of the same quality, sound absorption, and appearance but at less cost. This is a result of a Conwed engineering objective to develop products with reduced energy consumption.

For building owner and architect the savings can be substantial.

DATA SUMMARY CHART — NATURAL FISSURED

	Product Number	Size*	STC Range	NRC Range	Light Reflectance	C Factor @ 75° F.	Compatible Grid System Series Number	Fire Hazard Class	Fire Resistant Hourly Rate Assembly**	Suggested Installation Area
STANDARD CONCEALED TILE Butt K&R Beveled Edge	52429	⅝x12x12	40-44	.55-.65	LR1 (82%)	.724	444	25	—	Natural Fissured products look right in any interior environment and harmonize with virtually all interior finishes. They are a standard in architectural ceilings.
STANDARD CONCEALED TILE Butt K&R Square Edge	52428	⅝x12x12	40-44	.55-.65	LR1 (82%)	.724	444	25	—	
STANDARD CONCEALED TILE Butt K&R Beveled Edge	55429	¾x12x12	40-44	.55-.65	LR1 (82%)	.724	444	25	—	
STANDARD CONCEALED TILE Butt K&R Square Edge	55428	¾x12x12	40-44	.55-.65	LR1 (82%)	.724	444	25	—	
FIRE-RATED CONCEALED TILE Butt K&R Beveled Edge	50429	¾x12x12	40-44	.55-.65	LR1 (82%)	.767	450 455	25	1, 2, 3 Hour Ratings	
FIRE-RATED CONCEALED TILE Butt K&R Square Edge	50428	¾x12x12	40-44	.55-.65	LR1 (82%)	.767	450 455	25	1, 2, 3 Hour Ratings	
STANDARD REVEAL TILE Square-Rabbeted Reveal Edge	55400	¾x24x24	35-39	.55-.65	LR1 (82%)	.724	500 800	25	—	
FIRE-RATED REVEAL TILE Square-Rabbeted Reveal Edge	55401	¾x24x24	35-39	.55-.65	LR1 (82%)	.724	550 850	25	2 Hour Rating	

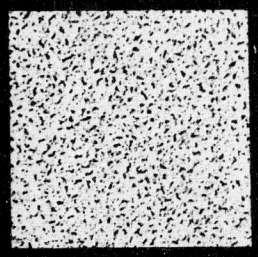
*Nominal size indicated

**See pages 18-23 for details

STANDARD PRODUCTS

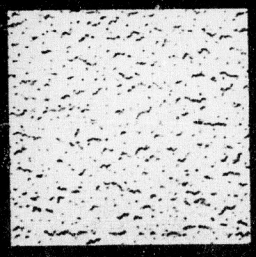
ACOUSTICAL PATTERNS

174 a



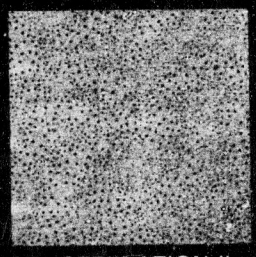
REGENCY

	Product Number	Size*	Edge Detail
CONCEALED TILE	55409	3/4x12x12	Butt K&R Beveled Edge
REVEAL EDGE TILE	56712	5/8x24x24	Square Rabbeted Reveal
LAY-IN PANELS	56722 56724 56748 56594 56593	5/8x24x24 5/8x24x48 5/8x20x60 5/8x24x60 5/8x30x60	Square Edge



FISSURA

SEMI-CONCEALED TILE	55316	5/8x24x48	Butt K&R, Beveled, long sides
CONCEALED TILE	55012 55207 55208	1/2x12x12 3/4x12x12 3/4x12x12	TGF Square Edge Butt K&R, Beveled Butt K&R, Square
REVEAL EDGE TILE	56503	5/8x24x24	Square Rabbeted Reveal
LAY-IN PANELS	56507 56537 56505 56583 56509 56560	5/8x24x24 5/8x24x36 5/8x24x48 5/8x20x60 5/8x24x60 5/8x30x60	Square Edge
VINYL COATED PANELS	56515	5/8x24x48	Square Edge



CONSTELLATION II

CONCEALED TILE	52342	5/8x12x12	Butt K&R Beveled
LAY-IN PANELS	56447 56449	5/8x24x24 5/8x24x48	Square Edge
VINYL COATED PANELS	56448	5/8x24x48	Square Edge



PEBBLED

LAY-IN PANELS	56584 56581	5/8x24x24 5/8x24x48	Square Edge



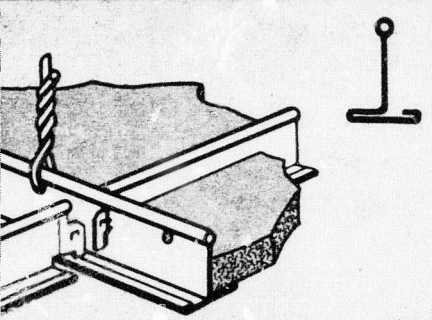
CELESTIAL

REVEAL EDGE TILE	52704	5/8x24x24	Square Rabbeted Reveal
LAY-IN PANELS	56704 56705	5/8x24x24 5/8x24x48	Square Edge

*Nominal size indicated

STC Range	NRC Range	Light Reflectance	C Factor @ 75° F.	Compatible Grid System Series Number	Fire Hazard Class
35-39	.50-.60	LR1 (86%)	.724	444	25
35-39	.50-.60	LR1 (86%)	.627	500, 800	25
35-39	.50-.60	LR1 (86%)	.627	500, 800, 818	25
40-44	.50-.60	LR1 (88%)	.627	800	25
35-39 40-44 40-44	.45-.55 .55-.65 .55-.65	LR1 (88%) LR1 (88%) LR1 (88%)	.724	444	25
35-39	.50-.60	LR1 (88%)	.627	500, 800	25
35-39	.50-.60	LR1 (88%)	.627	500, 800, 818	25
35-39	.50-.60	LR1 (88%)	.627	500, 800	25
30-34	.65-.75	LR1 (90%)	.724	444	25
35-39	.60-.70	LR1 (90%)	.627	500, 800	25
35-39	.60-.70	LR1 (90%)	.627	500, 800	25
35-39	.50-.60	LR1 (89%)	.627	500, 800	25
35-39	.50-.60	LR1 (89%)	.627	500, 800	25
35-39	.50-.60	LR1 (89%)	.627	500, 800	25

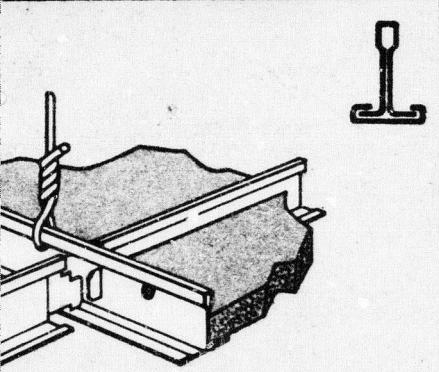
Snap-Grid® Exposed System



This widely used system features a choice of single or double web cross tees with identical locking devices at each end for ease of installation. Locking ends protect against lateral pull out yet permit removal for relocation at any time.

The single web (500 series) has a $^{15}/_{16}$" white face and cross tee slots 6" o.c. The double web has a 1" face with cross tee slots 12" o.c. Double web choices are white (530 series), black (580 series), aluminum cap (540 series); also available in walnut (570 series), and gold (590 series) on special order.

Standard Grid System

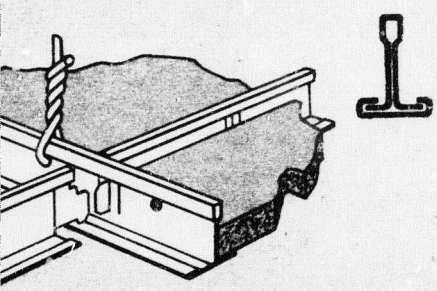


The 800 series features a $^{15}/_{16}$" face, double web construction and rectangular bulb design. The cross tee locking tabs prevent lateral pull out yet permit easy relocation. Choices include white face cappings (800, 810, and 811 series) aluminum caps and finish (840 series), walnut facings (870 series), and black facings (880 series).

An all aluminum (830 series) system provides resistance to corrosion caused by moisture and most chemical vapors. This series is particularly desirable for areas such as swimming pools and kitchens.

Where the suspension system must have a low light reflectance a special low gloss finish is provided in the 1911 series.

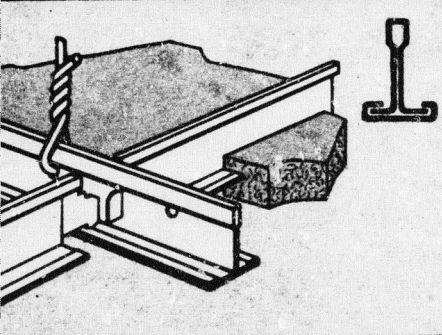
Exposed Grid System



Components of this exposed system offer all the features of the 800 series, plus greater flexibility for 60" x 60" modules.

Cross tee slots are placed in groups of three 2" o.c. every 10" along 10' main runners, and 10" o.c. from both ends of the 5' cross tees. This allows reversal of module direction and 60" x 20" openings.

Concealed Demountable System



Downward as well as upward access is available for concealed tile with the 444 system. Downward access is gained by opening the access components downward with an Access key, and removing those tile.

For direct access without an Access key, replace concealed cross tees at desired locations with downward access tees and angles, or upward top and bottom access angles. System rigidity and proper spacing is maintained by incorporating one of the following methods at least every four to six feet:

1. Locking concealed cross tees.
2. #826 spacer bars which lock onto the main runner bulbs.
3. #431 spacer clips which lock concealed cross tees together.

standard products suspension

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Conwed

500 Series

Product No.	Metal thickness	Flange Face	Height	Simple Span per ASTM C635-69 Lbs. per lineal ft.				Simple Span with Concentrated Load at Midspan — Lbs.				Continuous Span with Uniform Load Lbs. per lineal ft.	
Main Runner		in.	in.	4 Ft.		5 Ft.		4 Ft.		5 Ft.		4 Ft.	5 Ft.
500	.024	15/16	1½	16.1		8.5		35.9		29.5		42.0	24.0
511	.020	15/16	1½	12.3		6.2		22.9		20.5		28.0	16.0
530	.020	1	1⅜	12.5		6.7		31.6		21.5		35.0	28.0
Cross Tee				2 Ft.	3 Ft.	4 Ft.	5 Ft.	2 Ft.	3 Ft.	4 Ft.	5 Ft.		
502	.018	15/16	1⅜	40.0				61.5					
503	.018	15/16	1⅜		21.0				39.6				
504	.024	15/16	1⅜			13.6				43.3			
505	.018	15/16	1⅜				5.0				13.6		
509	.024	15/16	1⅜				8.5				20.2		
514	.018	15/16	1⅜			10.0				19.0			
524	.018	15/16	1			5.0				5.4			
532	.015	1	1⅜	70.0				90.0					
534	.015	1	1⅜			10.6				25.0			

To convert above data into lb. per sq. ft.: divide on center spacing of grid member into lb. per lineal ft.

Recessed Light Fixtures				
Product No.		Max. Fixture Weight — Lbs.		
Main Runner	Cross Tee	2'x4'	2'x2'	1'x4'
500	504	73.3	51.5	58.1
500	514	59.9	44.0	47.1
511	514	58.1	41.5	46.0
530	534	58.0	41.0	46.1

Surface Mounted Fixtures		
Main Runner	4 Ft.	5 Ft.
500	35.9	29.5
511	22.9	20.5
530	31.6	21.5

Hangers 4' or 5' o.c. both directions, anywhere along main runner. Maximum weight allowed per mounting point at midspan. For tandem fixtures, provide extra hangers.

800 Series

Product No.	Metal thickness	Flange Face	Height	Simple Span per ASTM C635-69 Lbs. per lineal ft.				Simple Span with Concentrated Load at Midspan — Lbs.				Continuous Span with Uniform Load Lbs. per lineal ft.	
Main Runner		in.	in.	4 Ft.		5 Ft.		4 Ft.		5 Ft.		4 Ft.	5 Ft.
800	.020	15/16	1½	16.0		9.0		41.7		28.5		54.0	38.1
810	.024	15/16	1½	18.5		10.3		45.0		32.1		64.6	46.0
811	.015	15/16	1½	12.6		6.0		30.5		17.6		48.5	32.6
830	.024	15/16	1½	7.5		4.0		20.0		13.0		36.2	22.0
1911	.015	15/16	1½	12.6		6.0		30.5		17.6		48.5	32.6
Cross Tee				2 Ft.	3 Ft.	4 Ft.	5 Ft.	2 Ft.	3 Ft.	4 Ft.	5 Ft.		
802	.015	15/16	1½	86.0				122.6					
803	.015	15/16	1½		41.4				77.7				
804	.020	15/16	1½			17.3				43.9			
805	.015	15/16	1½				6.4				19.1		
809	.020	15/16	1½				8.6				26.4		
814	.015	15/16	1½			14.1				37.8			
817	.015	15/16	1⅛			5.4							
822	.015	15/16	1½	26.0				35.3					
824	.015	15/16	1½			10.0				25.2			
332	.024	15/16	1½	47.8				66.7					
834	.024	15/16	1½			9.6				23.2			
1922	.015	15/16	1⅛	26.0				35.3					
1924	.015	15/16	1⅛			10.0				25.2			

To convert above data into lb. per sq. ft.: divide on center spacing of grid member into lb. per lineal ft.

Recessed Light Fixtures				
Product No.		Max. Fixture Weight — Lbs.		
Main Runner	Cross Tee	2'x4'	2'x2'	1'x4'
800	804	91.8	61.9	73.4
800	814	75.2	53.3	59.4
810	804	94.7	65.9	75.2
811	814	71.3	47.9	53.2
811	824	40.3	30.7	31.4
830	834	36.0	24.5	28.8
1911	1924	40.3	30.7	31.4

Surface Mounted Fixtures		
Main Runner	4 Ft.	5 Ft.
800	41.7	28.5
810	45.0	32.1
811	30.5	17.6
830	20.0	13.0
1911	30.5	17.6

Hangers 4' or 5' o.c. both directions, anywhere along main runner. Maximum weight allowed per mounting point at midspan. For tandem fixtures, provide extra hangers.

818 Series

Product No.	Metal thickness	Flange Face	Height	Simple Span per ASTM C635-69 Lbs. per lineal ft.		Continuous Span with Uniform Load Lbs. per lineal ft.	
Main Runner		in.	in.	4 Ft.	5 Ft.	4 Ft.	5 Ft.
818	.020	15/16	1½	16.0	9.0	54.0	38.1
Cross Tee				5 Ft.			
808	.020	15/16	1½	8.5			

To convert above data into lb. per sq. ft.: divide on center spacing of grid member into lb. per lineal ft.

Recessed Light Fixtures		
Product No.		Max. Fixture Weight — Lbs.
Main Runner	Cross Tee	20"x60"
818	808	46.7

444 Series

Product No.	Metal thickness	Flange Face	Height	Simple Span per ASTM C635-69 Lbs. per lineal ft.			Simple Span with Concentrated Load at Midspan — Lbs.			Continuous Span with Uniform Load Lbs. per lineal ft.	
Main Runner		in.	in.	4 Ft.		5 Ft.	4 Ft.		5 Ft.	4 Ft.	5 Ft.
811	.015	15/16	1½	12.6		6.0	30.5		17.6	48.5	32.6
Cross Tee				2 Ft.	4 Ft.	5 Ft.	2 Ft.	4 Ft.	5 Ft.		
68	.018	11/16	½	4.2			6.1				
70	.018	¾	⅞		2.4			6.3			
117	.018	¾	⅞		2.0						
142/144	.020	⅞	1½		10.7						
146/148	.020	⅞	1½		10.7						
170	.018	¾	⅞		2.4			6.3			
172	.018	¾	⅞	17.0			23.6				
174	.018	13/16	1⅛		5.5			13.5			
175	.018	13/16	1⅛			2.5					
805	.015	15/16	1½			6.4			19.1		
814	.015	15/16	1½		14.1			37.8			

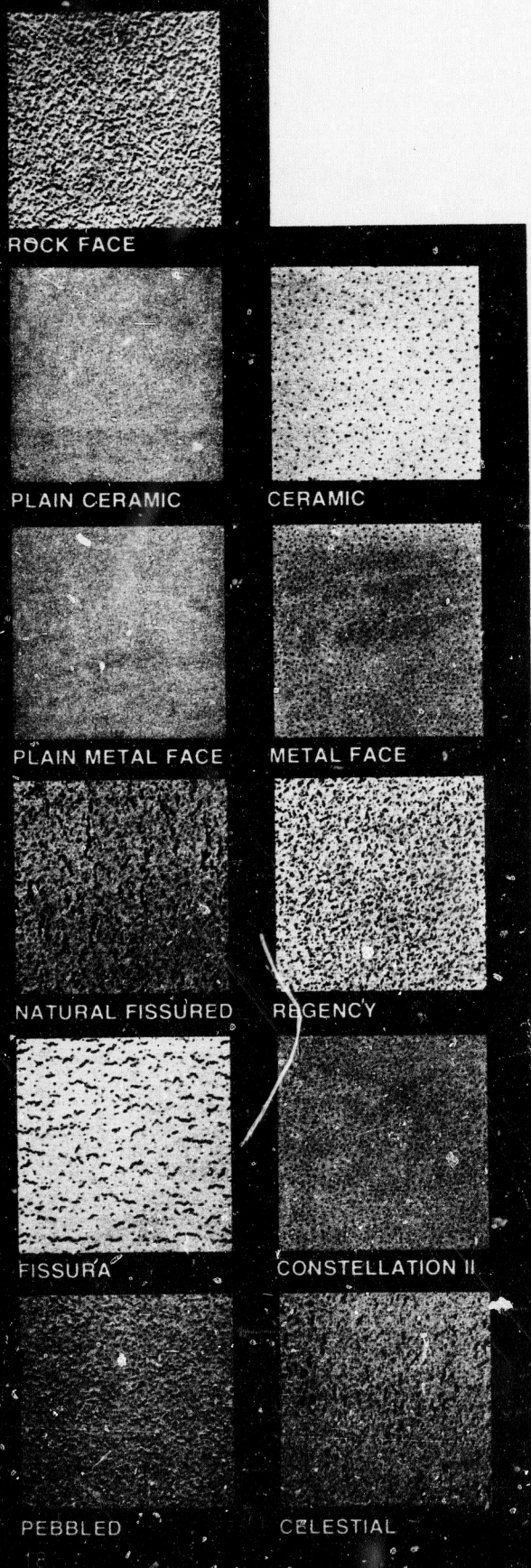
To convert above data into lb. per sq. ft.: divide on center spacing of grid member into lb. per lineal ft.

Recessed Light Fixtures				
Product No.		Max. Fixture Weight — Lbs.		
Main Runner	Cross Tee	2'x4'	2'x2'	1'x4'
811	814	71.3	47.9	53.2

Surface Mounted Fixtures		
Main Runner	4 Ft.	5 Ft.
811	30.5	17.6

Hangers 4' or 5' o.c. both directions, anywhere along main runner. Maximum weight allowed per mounting point at midspan. For tandem fixtures, provide extra hangers.

FIRE-RATED PRODUCTS
ACOUSTICAL PATTERNS



Two basic ASTM tests are used

Conwed Corporation has helped pioneer in the development and utilization of fire testing for more than 20 years. All Conwed ceiling products are evaluated under the ASTM E-84 Fire Hazard Test. Fire-rated products are also evaluated under the ASTM E-119 time design assembly test. Both tests are described below.

ASTM E-84 – Fire Hazard Test examines individual product performance in a controlled test fire. Surface burning characteristics are noted in three classifications: 1) smoke developed; 2) fuel contributed; 3) flame spread. A numerical rating of 0 to 100 is given for each classification, "0" being the least combustible.

ASTM E-119 – Time Design Fire Resistant Ratings grade ceiling performance of a building's basic structural assembly. Ratings are stated in hours (1, 1½, 2, etc.), and are given for specific floor-ceiling/roof-ceiling assemblies.

ROCK FACE

CERAMIC

METAL FACE

NATURAL FISSURED

REGENCY

FISSURA

CONSTELLATION® II

PEBBLED

CELESTIAL

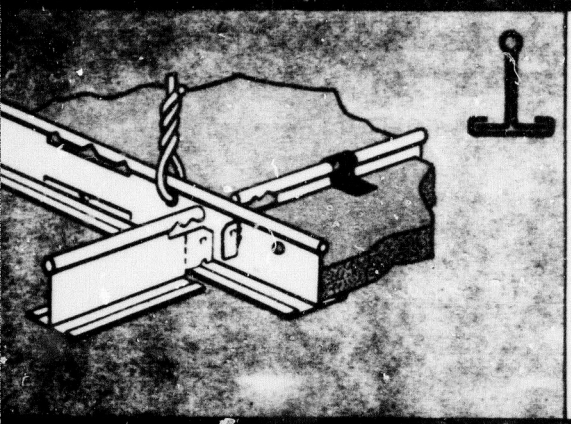
fire-rated products

acoustical patterns

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Conwed

Concealed Tile	55385	¾x12x12	Butt K&R Beveled	35-39	.50-.60	LR1 (86%)	.767	450, 455
Reveal Tile	55383	¾x24x24	Square-Rabbeted Reveal	35-39	.50-.60	LR1 (85%)	.724	550, 850
Lay-in Panels	56336 56381 56385	⅝x24x24 ⅝x24x48 ⅝x30x60	Square Edge	35-39	.50-.60	LR1 (86%)	.733	550, 850
Lay-in Panels	56644 56645 56646	⅝x24x24 ⅝x24x48 ⅝x24x48 (plain)	Square Edge Square Edge Square Edge	40-44 40-44 40-44	.50-.60 .50-.60 —	LR1 (86%)	.767	830
Lay-in Panels	56094 56096	⅝x24x48 (plain) ⅝x24x48	Square Edge Square Edge	35-39 35-39	— .55-.65	LR1 (98%)	.627	550, 850
Concealed Tile	50429 50428	¾x12x12	Butt K&R Beveled Butt K&R Square	40-44	.55-.65	LR1 (82%)	.767	450, 455
Reveal Tile	55401	¾x24x24	Square-Rabbeted Reveal	35-39	.55-.65	LR1 (82%)	.724	550, 850
Concealed Tile	50409	¾x12x12	Butt K&R Beveled	35-39	.50-.60	LR1 (86%)	.767	450, 455
Lay-in Panels	56732 56734 56590 56592 56591	⅝x24x24 ⅝x24x48 ⅝x20x60 ⅝x24x60 ⅝x30x60	Square Edge	35-39	.50-.60	LR1 (86%)	.733	550, 850
Lay-in Panels	56512 56536 56511 56597 56542 56565	⅝x24x24 ⅝x24x36 ⅝x24x48 ⅝x20x60 ⅝x24x60 ⅝x30x60	Square Edge	40-44	.50-.60	LR1 (88%)	.733	550, 850
Vinyl Coated Panels	56517	⅝x24x48	Square Edge	35-39	.50-.60	LR1 (88%)	.627	550, 850
Lay-in Panels	56917 56919	⅝x24x24 ⅝x24x48	Square Edge	35-39	.60-.70	LR1 (90%)	.733	550, 850
Lay-in Panels	56441 56498	⅝x24x24 ⅝x24x48	Square Edge	35-39	.50-.60	LR1 (89%)	.733	550, 850
Lay-in Panels	56766 56765	⅝x24x24 ⅝x24x48	Square Edge	35-39	.50-.60	LR1 (89%)	.733	550, 850

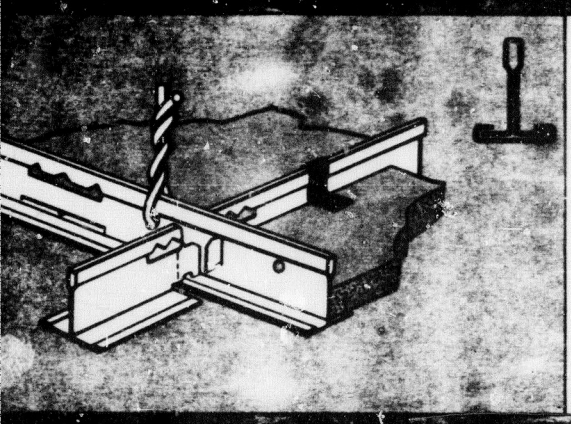
*Nominal size indicated



Performance under supervised fire conditions has earned many U.L. Designs for the 550 Snap Grid. This system offers a double thickness steel web with a 1" exposed face.

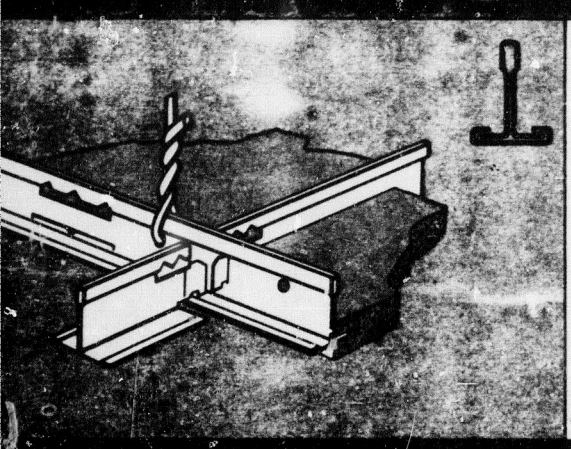
The straight locking feature of the cross tee allows easy installation in obstructed areas. Complete flexibility is assured as all parts are relocatable and reversible. Cross tee slots are located 12" o.c. along main runners.

Exposed flanges are available in white (550 Series), black (556 Series) and aluminum cap and finish (560 Series). Gold, walnut, and other colors are available on special order.



U.L. approved protection for several different constructions covering the basic forms of assembly in current use is provided by this double web system with a $^{15}/_{16}$" exposed face. Cross tee slots are located 6" o.c. along the main runner. The straight locking feature of the cross tees allows for easy installation in obstructed areas without sacrificing flexibility.

Exposed flanges are available in white (850 Series), black (856 Series) and aluminum cap and finish (860 Series). Other colors are available on special order.

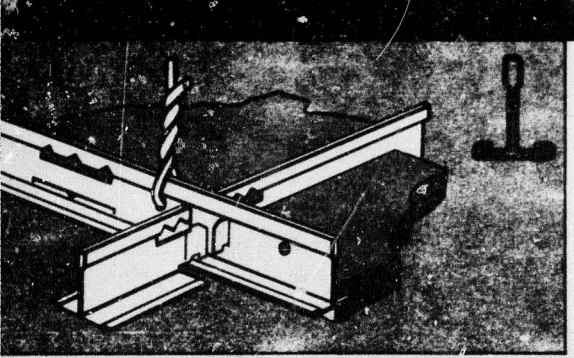


This concealed double web, $^{15}/_{16}$" face ceiling system offers full upward or downward access to the plenum area and a 2 hour U.L. fire rating.

Downward access is achieved with an Access Key, as discussed in the 444 system.

Direct upward access is gained by replacing concealed cross tees with top and bottom access angles and #224 clips. By sliding the clip open and pushing upward, access is achieved.

Main runners have cross tee slots 6" o.c., and 4' cross tees are slotted at midpoint.



This U.L. approved double web system has the same upward and downward access features as the 450 concealed system. The 455 system, however, works in a 5'x5' layout with 12"x12" tile.

Cross tee slots are located 6" o.c. along the main runner, 5' cross tees are slotted at midpoint and 12" from either end.

fire-rated products

suspension

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Conwed

Product No.	Metal thickness	Flange Face	Height	Simple Span per ASTM C635-69 Lbs. per lineal ft.			Simple Span with Concentrated Load at Midspan — Lbs.			Continuous Span with Uniform Load Lbs. per lineal ft.	
Main Runner		in.	in.	4 Ft.		5 Ft.	4 Ft.		5 Ft.	4 Ft.	5 Ft.
550	020	1	1 3/8	12.2		6.1	31.3		18.6	35.8	18.0
560	020	1	1 3/8	10.2			26.2			32.2	
Cross Tee				2 Ft.	4 Ft.	5 Ft.	2 Ft.	4 Ft.	5 Ft.		
552	020	1	1 3/8	93.0			132.5				
554	020	1	1 3/8		13.6			31.9			
555	020	1	1 3/8			7.2			24.3		
562	020	1	1 3/8	70.8			96.6				
564	020	1	1 3/8		12.8			33.1			

To convert above data into lb. per sq. ft., divide on center spacing of grid member into lb. per lineal ft.

Recessed Light Fixture					
Product No.		Max. Fixture Weight — Lbs.			
Main Runner	Cross Tee	2½ x5'	2'x4'	2'x2'	1'x4'
550	552			47.2	
550	554		69.8		56.2
550	555	44.7			
560	564		58.3	39.4	46.9

Product No.	Metal thickness	Flange Face	Height	Simple Span per ASTM C635-69 Lbs. per lineal ft.		Simple Span with Concentrated Load at Midspan — Lbs.		Continuous Span with Uniform Load Lbs. per lineal ft.
Main Runner		in.	in.	4 Ft.		4 Ft.		4 Ft.
850	015	15/16	1½	12.6		30.5		39.4
860	015	15/16	1½	10.5		25.2		37.8
Cross Tee				2 Ft.	4 Ft.	2 Ft.	4 Ft.	
852	015	15/16	1½	86.0		122.6		
854	015	15/16	1½		14.1		37.8	
862	015	15/16	1½	58.9		80.0		
864	015	15/16	1½		13.6		33.0	

To convert above data into lb. per sq. ft., divide on center spacing of grid member into lb. per lineal ft.

Recessed Light Fixture				
Product No.		Max. Fixture Weight — Lbs.		
Main Runner	Cross Tee	2'x4'	2'x2'	1'x4'
850	854	71.3	47.9	53.2
860	864	59.4	39.9	46.6

Product No.	Metal thickness	Flange Face	Height	Simple Span per ASTM C635-69 Lbs. per lineal ft.		Continuous Span with Uniform Load Lbs. per lineal ft.
Main Runner		in.	in.	4 Ft.		4 Ft.
850	015	15/16	1½	12.6		44.0
Cross Tee				2 Ft.	4 Ft.	
68	018	11/16	½	4.2		
70	018	¾	⅞		2.4	
82/84	020	15/16	13/16		2.6	
142/144	020	⅞	1½		10.7	
146/148	020	⅞	1½		10.7	
182/184	020	15/16	1⅛		5.3	
854	015	15/16	1½		14.1	

To convert above data into lb. per sq. ft., divide on center spacing of grid member into lb. per lineal ft.

Recessed Light Fixture				
Product No.		Max. Fixture Weight — Lbs.		
Main Runner	Cross Tee	2'x4'	2'x2'	1'x4'
850	854	71.3	47.9	53.2

Product No.	Metal thickness	Flange Face	Height	Simple Span per ASTM C635-69 Lbs. per lineal ft.				Continuous Span with Uniform Load Lbs. per lineal ft.
Main Runner		in.	in.	4 Ft.				4 Ft.
850	.015	15/16	1½	12.6				44.0
Cross Tee — Access Angle		in.	in.	2 Ft.	3 Ft.	4 Ft.	5 Ft.	
73	.018	¾	⅞		5.8			
81/86	.020/.024	15/16	13/16		4.7			
142/143/145	.020	⅞	1½				5.3	
146/149	.020/.024	⅞	1½				6.1	
179	.030	13/16	1⅛				4.6	
181/182/183/185	.020/.020/.020/.030	15/16	1⅛				4.1	
852	.015	15/16	1½	86.0				
854	.015	15/16	1½			14.1		
855	.015	15/16	1½				6.4	

To convert above data into lb. per sq. ft., divide on center spacing of grid member into lb. per lineal ft.

Recessed Light Fixture				
Product No.		Max. Fixture Weight — Lbs.		
Main Runner	Cross Tee	2'x4'	2'x2'	1'x4'
850	854	71.3	47.9	53.2

DATA CHART, INDIVIDUAL PRODUCTS
FIRE HAZARD RATING

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Note: Standard Conwed products as well as Conwed fire-rated products (tested by time design assembly) carry fire hazard ratings.

			Fire-Rated				
CONCEALED TILE	Rock Face Regency	Natural Fissured	X		15	20	10
LAY-IN PANELS	Rock Face Regency Fissura Constellation II	Natural Fissured Pebbled Celestial Metal Face	X		15	20	10
LAY-IN PANELS	Ceramic		X		0	0	0
REVEAL	Rock Face	Natural Fissured	X		15	20	10
CONCEALED TILE	Rock Face Regency Fissura	Constellation II Natural Fissured		X	25	20	10
LAY-IN PANELS	Rock Face Regency Fissura Constellation II	Natural Fissured Pebbled Celestial		X	25	20	10
LAY-IN PANELS	Metal Face			X	15	20	10
REVEAL	Rock Face Regency Fissura	Natural Fissured Celestial		X	25	20	10
SEMI-CONCEALED	Fissura			X	25	20	10

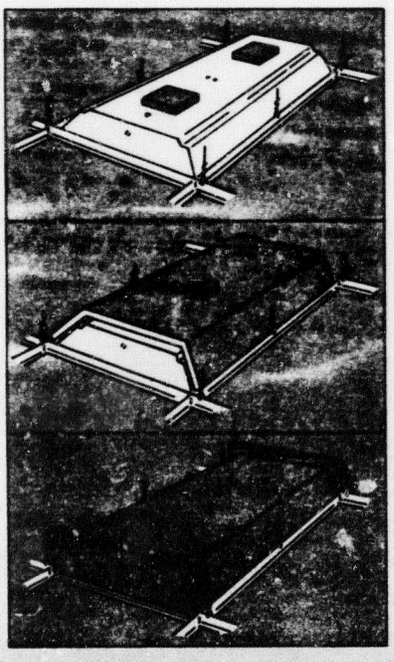
FIRE PROTECTION BATTS

Conwed Fire Protection Batts offer economical recessed light fixture and air duct protection for U.L. fire-rated assemblies. The batts can be easily assembled to fit all recessed light fixtures and air ducts. By reducing the labor required for installation, they can contribute a significant savings in construction costs on projects specifying fire-rated time design ceiling construction.

Conwed Fire Protection Batts are approved for use with the following Underwriters' Laboratories Fire Resistive Designs:

A-202 (224-3)	G-203 (305-2)	J-201 (307-2)
A-815 (43 -2)	G-204 (208-2)	L-202 (45 -1)
G-006 (288-2)	G-206 (48 -1)	P-202 (RC-13-1)
G-007 (318-2)	G-215 (309-2)	P-203 (RC-1-45)
G-202 (282-2)	G-240 (233-2)	

Procedure: 2' x 4' and 1' x 4' Non-Air Handling Light Fixture



1. Place 6" x 6" spacers on fixture 6" in from each end. (Not over ballasts.)
2. Wedge 30" x 4' top piece between fixture body and hanger wires; form over spacers and wedge down between wires and fixture on opposite side. (Note: Fabricate batts as illustrated to allow air space for Class P Ballast operation.)
3. Stand 6" x 24" end pieces loosely at each end. Hold in place with a light gauge twisted wire at each corner.

The U.L. Designs are arranged in hourly sequence within each classification of concealed tile, panels, and reveal. Note the initials "R" & "F" have been used to denote Roof/Ceiling or Floor/Ceiling assemblies.

DATA CHART, ASSEMBLIES TIME DESIGN FIRE RESISTANCE RATING

Fire-Rated Concealed Tile Rock Face Regency Fissura Constellation II Natural Fissured	G-001 (35-1 hr.)	1 hr.	1 hr.	⅝x12x12	24x48/24%	110	"F" 2" concrete metal lath, 10" bar joists 24" o.c.
	G-002 (268-2 hr.)	2 hr.	—	⅝x12x12 ¾x12x12	24x48/24%	576	"F" 2½" concrete, metal lath, 10" beam, 10" bar joists 24" o.c.
	G-006 (288-2 hr.)	2 hr.	2 hr.	¾x12x12	24x48/20%	576	"F" 2½" concrete, metal lath, 10" beam, 10" bar joists 24" o.c.
	G-007 (318-2 hr.)	2 hr.	2 hr.	¾x12x12	24x48/25%	196	"F" 2½" concrete, metal lath, 10" beam, 10" bar joists 24" o.c.
	A-003 (45-3 hr.)	3 hr.	4 hr.	¾x12x12	24x48/9%	—	"F" 2½" concrete, cellular deck, 10" beam.
Fire-Rated Lay-in Panels Rock Face Regency Fissura Constellation II Natural Fissured Pebbled Heritage Celestial Ceramic Metal Face	P-203 (RC-1-45 min.)	¾ hr.	¾ hr.	⅝x24x48	24x48/24%	113	"R" Built up roof, 1-2" insulation, steel deck, 8" joists 60" o.c.
	G-201 (24-1 hr.)	1 hr.	1 hr.	⅝x24x48	24x48/8%	—	"F" 2" concrete, metal lath, 10" bar joists 24" o.c.
	G-206 (48-1 hr.)	1 hr.	1 hr.	⅝x24x60	24x48/24%	113	"F" 2½" concrete, metal lath, 10" bar joists 24" o.c.
	L-202 (45-1 hr.)	1 hr.	—	½x24x60 ⅝x24x36	24x48/16%	110	"F" Wood floor, wood joists 16" o.c.
	P-201 (RC-7-1 hr.)	1 hr.	1 hr.	⅝x24x48	—	—	"R" Built up roof, ¾" insulation, steel deck, 10" joists 84" o.c.
	P-202 (RC-13-1 hr.)	1 hr.	1 hr.	⅝x24x48	24x48/16%	57	"R" Built up roof, 1" insulation, steel deck, 8" joists 48" o.c.
	G-205 (29-1½ hr.)	1½ hr.	1½ hr.	⅝x30x60	—	—	"F" 2½" concrete, metal lath, 10" bar joists 24" o.c.
	D-201 (211-2 hr.)	2 hr.	3 hr.	⅝x24x48	24x48/24%	576	"F" 2½" concrete, cellular deck, 8" beam.
	D-209 (43-2 hr.)	2 hr.	1½ hr.	⅝x24x24	24x48/8%	—	"F" 2½" concrete, fluted cellular deck, 10" beam.
	G-202 (282-2 hr.)	2 hr.	—	⅝x24x48	24x48/25%	576	"F" 2½" concrete, metal lath, 10" bar joists 24" or 30" o.c.
	G-203 (305-2 hr.)	2 hr.	2 hr.	⅝x15x60	30x60/50%	126	"F" 3" concrete, corrugated steel deck, 10" joists 30" o.c.
	G-204 (280-2 hr.)	2 hr.	2 hr.	⅝x24x24 to 30x60	30x60/25%	110	"F" 2½" concrete wire fabric, 10" joists 30" o.c.
	G-207 (206-2 hr.)	2 hr.	—	⅝x24x24, 48x36	—	—	"F" 2½" concrete, metal lath, 10" bar joists 24" o.c.
	G-208 (36-2 hr.)	2 hr.	—	⅝x24x60	24x48/25%	576	"F" 2½" concrete, wire fabric, 10" joists 24" o.c.
	G-213 (306-2 hr.)	2 hr.	3 hr.	⅝x24x48	24x48/25%	154	"F" 2½" concrete, metal lath, steel deck, 10" joists 24" o.c.
	G-215 (309-2 hr.)	2 hr.	3 hr.	¾x24x24	24x48/25%	154	"F" 2½" concrete, metal lath, 10" bar joists 24" o.c.
	G-240 (233-2 hr.)	2 hr.	—	⅝x24x48 ⅝x24x60	24x48/24%	110	"F" 2½" concrete, metal lath, 10" joists 24" o.c.
	J-201 (307-2 hr.)	2 hr.	—	⅝x24x48	24x48/25%	576	"F" 2½" concrete, concrete pan beam.
	A-204 (224-3 hr.)	3 hr.	3 hr.	⅝x24x48	24x48/24%	113	"F" 3" concrete, cellular deck, 8" beam.
	G-213 (306-2 hr.)	3 hr.	3 hr.	⅝x24x48	24x48/25%	154	"F" 3½" concrete, metal lath, steel deck, 10" joists 24" o.c.
	G-215 (309-3 hr.)	3 hr.	3 hr.	¾x24x24	24x48/25%	154	"F" 3¼" concrete, metal lath, 10" bar joists 24" o.c.
Fire-Rated Reveal Rock Face Natural Fissured	G-215 (309-3 hr.)	2 hr.	3 hr.	¾x24x24	24x48/25%	154	"F" 3½" concrete, metal lath, 10" bar joists 24" o.c.

*For product size availability, refer to Data Summary Charts on pages 7, 9, 11, 13, 18 and 19.

1201 air bar

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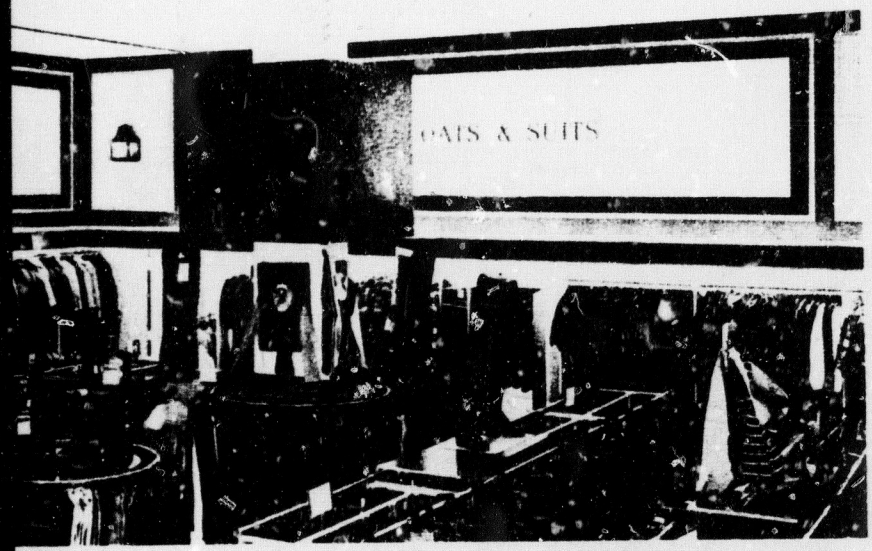


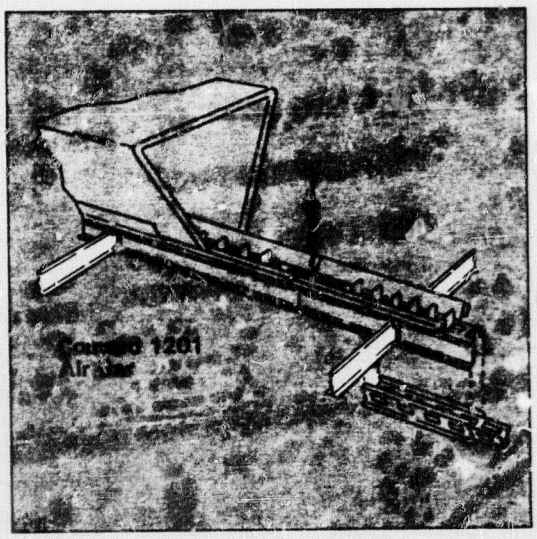
Project: Montgomery Ward and Co., Green Bay, Wisconsin
Product: Conwed 1201 Air Bar
Architect: Liebenberg, Kaplan, Glotter, and Associates
Mechanical Engineer: Wm. Sutherland and Associates

High quality air distribution for budget installations

Compatible with standard exposed grid systems, the 1201 Series Air Bar provides a reliable, aesthetically pleasing air distribution system for large interiors.

Conwed Exposed Tee 500/550 Suspension System (see pages 16, 17, 20, and 21) integrates with 1201 Series Air Bar for easy installation.





QUICK SUMMARY PERFORMANCE DATA			
cfm/LF	2-way throw (50 fm)	NC	Middle fed Static Pressure*
10	3	—	.015"
20	7	20	.04"
30	10	30	.09"
40	13	38	.16"
50	16	43	.24"
60	19	49	.34"

*Static pressure for end feed air tubes will be 75% of table values.

MAXIMUM ACTIVE AIR BAR RUN ONE DIRECTION*	MINIMUM TRIANGULAR DUCT SIZE
20'	11" x 11" x 11"
40'	16" x 16" x 18"
70'	22" x 22" x 22"
110'	27" x 27" x 27"
150'	33" x 33" x 33"

*By introducing air at midpoint of air bar duct, the maximum active run can be doubled.

Part 1 General

1.01 Work Installed

A. The work under this section shall be subject to the requirements of the general conditions, the drawings, schedules, addenda, and other contract documents.

B. Installation of ceiling materials covered in this section shall be by a contractor approved by the manufacturer.

C. Substitutions will not be permitted for materials and methods covered in this section.

1.02 Job Conditions

A. Installation of acoustical treatment shall not begin until all wet work, such as plastering, concrete, and terrazzo work, is completely dry. These materials are designed for installation under standard occupancy conditions from 60°F to 85°F at not more than 80% R.H., in an enclosed building.

B. The acoustical contractor shall be responsible for the examination and acceptance of all surfaces and conditions effecting the proper material installation, and shall not proceed until all unsatisfactory conditions are corrected by others.

Part 2 Products

2.01 Acoustical Materials

A. Lay-In Panels

1. Acoustical material shall be (select pattern) Conwed Mineral Acoustical Ceiling Panels, as manufactured by the Conwed Corp., St. Paul, MN.

2. These units shall be (thickness) x (length) x (width) and shall conform to FS SS-S-118a, Class 25, AIMA Class I (0-25).

3. The material shall be manufactured by the wet-felted process and have a factory applied, washable, white vinyl latex paint finish with a light reflectance of "a" (over 75%).

4. *Abuse Resistant Ceilings only:*

   a. Acoustical material shall be Conwed Rock Face Mineral Acoustical Panels as manufactured by Conwed Corp., St. Paul, MN.

   b. The material shall have a specifically compounded surface, texture, and formulation designed to provide resistance to blows and scuffs.

   c. The Rock Face material shall be capable of withstanding without marring, deformation, or breakage, the varied kinds of abuse which ceilings normally face after installation.

   d. The acoustical material must provide an average resistance to surface deformation of 150 pounds as measured by the standard ball hardness test procedure using a 2" steel sphere (ASTM C367).

5. *Ceramic Ceilings only:*

   a. Acoustical materials shall be (Heritage) (Plain) Conwed Ceramic Acoustical Ceiling Panels, as manufactured by the Conwed Corp., St. Paul, MN.

   b. These units shall be 5/8" x (length) x (width).

   c. The material shall be unaffected by moisture and resistant to chlorine and most acid atmospheres.

6. *Metal Face Ceilings only:*

   a. Metal Face Ceiling Panels shall be (Embossed Perforated) (Embossed non-perforated) Conwed mineral metal face panels manufactured by the Conwed Corp., St. Paul, MN.

   b. These units shall be 5/8"x24"x48".

   c. The material shall be manufactured by the wet-felted process and have a factory applied, vinyl coated aluminum face with a light reflectance of "a" (over 75%).

   d. This material shall withstand 5,000 cycles in accordance with the Gardner Scrubability Test Method.

B. Tile

1. Acoustical material shall be (select pattern) Conwed Mineral Acoustical Tile, as manufactured by the Conwed Corp., St. Paul, MN.

2. These units shall be (thickness) x 12" x 12", shall conform to FS SS-S-118a, Class 25, AIMA Class I (0-25), and shall have (Butt K & R) (T & G Flange) (Square) (Bevel) edge detail in accordance with AIMA AM Spec. No. 20.

3. The material shall be manufactured by the wet-felted process and have a factory applied, washable, white vinyl latex paint finish with a light reflectance of "a" (over 75%).

4. *Abuse Resistant Ceilings only:*

   a. Acoustical material shall be Conwed Rock Face Mineral Acoustical Tile as manufactured by Conwed Corp., St. Paul, MN.

   b. The material shall have a specially compounded surface, texture, and formulation designed to provide resistance to blows and scuffs.

   c. The Rock Face material shall be capable of withstanding without marring, deformation, or breakage, the varied kinds of abuse which ceilings normally face after installation.

   d. The acoustical material must provide an average resistance to surface deformation of 150 pounds as measured by the standard ball hardness test procedure using a 2" steel sphere (ASTM C367).

C. Reveal Products

1. Acoustical material shall be (select pattern) Conwed Mineral Acoustical reveal-edged products, as manufactured by the Conwed Corp., St. Paul, MN.

2. These units shall be (¾") (⅝") x 24" x 24" and shall conform to FS SS-S-118a, Class 25, AIMA Class I (0-25).

3. The material shall be manufactured by the wet-felted process and have a factory applied, washable, white vinyl latex paint finish with a light reflectance of "a" (over 75%).

4. *Abuse Resistant Ceilings only:*

   a Acoustical Material shall be Conwed Rock Face Mineral Acoustical Panels as manufactured by Conwed Corp., St. Paul, MN.

   b. The material shall have a specially compounded surface, texture, and formulation designed to provide resistance to blows and scuffs.

   c. The Rock Face material shall be capable of withstanding without marring, deformation, or breakage, the varied kinds of abuse which ceilings normally face after installation.

   d. The acoustical material must provide an average resistance to surface deformation of 150 pounds as measured by the standard ball hardness test procedure using a 2" steel sphere (ASTM C367).

D. Semi-Concealed Products

1. Acoustical Material shall be (select pattern) Conwed Mineral Acoustical semi-concealed panels, as manufactured by the Conwed Corp., St. Paul, MN.

2. These units shall be ⅝" x 24" x 47¾", shall conform to FS SS-S-118a, Class 25, AIMA Class I (0-25), and on the two long sides shall have Butt K & R edge details. These details are in accordance with AIMA AM Spec. No. 20.

3. The material shall be manufactured by the wet-felted process and have a factory applied, washable, white vinyl latex paint finish with a light reflectance of "a" (over 75%).

E. Performance Requirements

1. Acoustical Materials shall have a Noise Reduction Coefficient (NRC) range of (.50 - .60) (.55 - .65) (.60 - .70) (.65 - .75) (.70 - .80) according to ASTM C423 Sound Absorption of Acoustical Materials in Reverberation Rooms.

2. The Sound Transmission Class (STC) range shall be (30-34) (35-39) (40-44), according to AIMA 1-II Ceiling Sound Transmission Test by Two-Room Method.

2.02 Suspension Materials

A. Exposed Grid Systems

1. The exposed ceiling Suspension System shall be the ( ) Series Grid System, as supplied by Conwed Corp., St. Paul, MN.

2. All components shall conform to the (light) (intermediate) (heavy duty) structural classification of ASTM C635-69.

3. Main runners and cross tees shall be of cold rolled (steel) (aluminum) with a ( ) factory applied paint finish on a (15/16") (1") flange face.

4. Wall (angles) (channels) and corner caps shall be of like material and finish.

5. Humidity Resistant Products only (Ceramic):

   a. Suspension system shall be the Conwed 830 Series all aluminum exposed grid suspension system.

B. Concealed Accessible Grid Systems

1. The concealed accessible ceiling suspension system shall be the ( ) Grid System as supplied by Conwed Corp., St. Paul, MN.

2. Main runners shall conform to the Intermediate Duty classification of ASTM C635-69.

3. Entire suspension system shall be of cold rolled electrogalvanized steel.

4. Wall channels and corner caps shall be of like material and finish.

C. Semi-Concealed Systems

1. The semi-concealed suspension system shall be the 811 Main Runner and concealed support members as supplied by the Conwed Corp., St. Paul, MN.

2. Main runners shall conform to the Intermediate Duty Classification of ASTM C635-69.

3. All components shall be of cold rolled steel with the main runner having a ( ) factory applied paint finish.

4. Wall channels and corner caps shall be of like material and finish.

2.03 Fire Protection

A. Acoustical materials shall conform to FS SS-S-118a, Class 25, AIMA Class I (0-25).

B. Fire-rated installation shall be composed of Conwed Fire-Rated Tile or Panels and Conwed Fire-Rated Suspension Systems.

C. The fire resistive ceiling assembly shall be identified by U.L. Design Number ( ) under Underwriters' Laboratories, Inc. Building Materials List, to provide ( ) hour fire-rated protection.

Part 3 Execution

3.01 Installation

A. All acoustical materials and suspension systems shall be installed under conditions as outlined in the current bulletin of the Acoustical and Insulating Materials Association and by an approved Conwed Corp. acoustical contractor.

B. Installation of products in this section shall occur after all components in the ceiling plenum are installed. The building shall be in proper condition to receive the acoustical materials and suspension system before any of the

material shall be installed. The acoustical material shall be installed under conditions of normal occupancy. All wet work shall be completed, dry, and the building fully enclosed.

C. Furnish and install the acoustical materials and suspension systems as specified above, per the recommendation of ASTM C636-69. Deflection of any component must not exceed $^{1}/_{360}$ of the span.

D. Furnish and install the acoustical materials and suspension systems as specified above. The acoustical units shall be installed in strict accordance with the manufacturer's recommendations.

E. Exposed Grid Systems only:

1. Main runners shall be suspended on (24), (36), (48), (60) inch centers by not less than 12 gauge galvanized steel wire spaced not more than (48), (60) in. on center along the main runners.
2. Cross tees (12), (24), (36), (48), (60) inches in length shall be spaced (in.) on center along the main runner to form ( ) x ( ) modules.
3. Install wall mouldings at intersection of suspended ceiling and all vertical surfaces.
4. Miter corners where wall mouldings intersect or install corner caps.

F. Concealed Accessible Grid Systems

1. The grid shall be installed as specified above with the following additions.
2. System shall be installed to form individual modules at least two tiles in width and three tiles in length. (Direct access must be available to each _____ ft. x _____ ft. area.)
3. Main runners shall be installed on (24), (48), (60) inch centers and be suspended by not less than 12 gauge galvanized steel wire spaced (48), (60) in. on center along the main runner.
4. Main runners shall be connected at (48), (60) in. centers by (interlocking cross tees), (spacer bars), (spacer clips and concealed tees).
5. Concealed cross tees shall be (24), (48), (60) inches long and be placed in the tile kerfs (12), (24) in. on center.
6. At each point of access the following will replace each concealed tee: [Upward access: one bottom angle (24), (48), inches long and two top access angles (12), (24), inches long]; [Downward access: One downward access tee (24), (48), inches long and one downward access angle (10½), (24), inches long.]
7. White vinyl light fixture trim shall be placed around all noted light fixtures.
8. Install wall moulding at intersection of suspended ceiling and vertical surfaces. Spring spacers shall be installed between wall mouldings and each acoustical tile.
9. Leveling splines shall be installed in the kerf of each tile not occupied by a main runner, cross tee or access component. Splines should not be placed at point of direct access with openings of 2 sq. ft. or less.

G. Semi-Concealed Grid Systems only:

1. Main runner shall be installed on 48 inch centers and be suspended by 12 gauge galvanized steel wire spaced 48 inches on center along the main runner.
2. Each runner shall be connected on 48 inch centers by (interlocking cross tees) (spacer bars).
3. The tile shall be supported 24 inches each side of the (spacer bar) (interlocking cross tee) by (concealed tees ¾" x ⅞" x .018) (number 184 access angles in each kerf of the tile).
4. (If spacer bars are used, concealed tees ¾" x ⅞" x .018 shall be used 48 inches o.c. below the spacer bars.)

H. Ceramic Ceilings only (exterior soffits):

1. The ceiling system shall be as specified for exposed grid except the suspension system shall be the Conwed 840 all aluminum Series suspension system with aluminum cap. The main runners shall be spaced 24" o.c. and be suspended by rod or standard hanger wire stiffened by suitable lengths of 1½" channel 96" o.c.
2. The acoustical panels shall be secured in place by wires strung through the center holes of the cross tees. This wire will bear on lengths of channel 1½" x (length of the ceiling panel) that rests on the back of the ceiling board. The wires shall be drawn tight and secured so there is no vertical movement of the panels.
3. Provide 24" x 24" egg crate louvers in every twentieth grid opening to allow for quick equalization of pressure differentials caused by wind.
4. Access panels shall be provided where shown on the plans. These shall be composed of standard panels framed with number 678 slip-on moulding (½" x ⅝" x ⅞") attached to the flange of the suspension system by sheet-metal screws.

3.02 Fire-Rated Installation

A. Installation shall be as specified in 3.01 with the following additions:

1. The installation shall conform to the acoustical material manufacturer's recommendations so as to achieve the fire resistive time design number ( ) as listed by Underwriters' Laboratories.
2. The contractor shall furnish and install the suspension system as specified above per the recommendation of ASTM C636-69 and the listed U.L. Design.
3. The contractor shall furnish and install the acoustical material as specified above and listed in the U.L. Design.

NOTES AND REFERENCES

As with most construction materials, the observance of a few common sense procedures and precautions will insure trouble-free installation and long life of your Conwed acoustical ceiling products.

JOB SITE STORAGE

Prior to installation, Conwed acoustical material should be allowed to assume room temperatures and humidity. Installation and storage conditions should be very similar to those expected during building occupancy.

If acoustical materials are exposed to moisture or large temperature variations while stored during or after installation, swelling or shrinkage can result. It is recommended that proper humidity and temperature control be provided and maintained prior to commencing work. (Conwed ceramic panels do not require these precautions as they are unaffected by moisture.)

JOB SITE INSPECTION

Upon delivery of materials:

1. Insure delivered materials are same as accepted samples.
2. Store materials in a dry, clear area.
3. Have damaged material removed from project site.

Before installation of acoustical treatment, check that:

1. Temperature and humidity are close to expected normal.
2. Concrete, plaster and terrazzo work is complete and dry.
3. Windows and doors are in place and glazed.
4. Roof decks are cured and dry.
5. Attic spaces are ventilated to the outside.
6. Heat is present, if needed.
7. Surfaces are acceptable before start of work. Verify that surfaces are:
   a) Level and free from irregularities.
   b) Dry and clean.
   c) Tested for adhesive bond
8. Ductwork and conduits are completed.

During installation verify that:

1. The work installed is in accordance with specifications and manufacturer's literature.
2. Soiled or damaged units have been replaced.

GENERAL MAINTENANCE OF ACOUSTICAL MATERIALS

LOOSE DIRT such as ordinary dust may be removed with a soft brush (the type used by window washers is excellent). Even better is a vacuum cleaner with a soft brush attachment. Please clean in one direction only so dust will not be rubbed into the surface. For normal maintenance, such brushing and vacuum cleaning is usually sufficient.

SPOTS AND MARKS such as small spots and streaks can be removed in most cases by using an art gum eraser available at most stationery stores. Larger smudges may be removed with wallpaper cleaner available at hardware stores, wallpaper stores, and some supermarkets. These cleaners (either putty type or paste type) should be used with care and common sense. Be sure to use fresh wallpaper cleaner, as old cleaners may crumble or be soiled. Colored chalks or white liquid shoe polish can do wonders to touch up nicks, scratches, etc.

WASHING — All acoustical tile with reasonably smooth surfaces may be washed if common sense is used. Properly done, cleaning such as described below will have little or no effect on the acoustical efficiency of the ceiling tile. For best results follow these general rules:

1. Use a mild soap such as white soap flakes or white facial soap. Mix soap with warm water to make suds. Some detergents are satisfactory but should be used with care or tested first on an inconspicuous spot.
2. DO NOT SOAK TILES WITH WATER — Use either a cloth or sponge "wrung dry" and use long sweeping, gentle strokes to wipe surfaces of the tile. If too much water is used, this may warp the tile.
3. Rinse tile by wiping with a DAMP cloth or sponge dipped frequently in warm or cold water and "wrung dry." BE SURE THAT TILES ARE NOT MOISTENED EXCESSIVELY.
4. If the tiles have been installed with an adhesive, it is desirable to postpone cleaning or painting for at least 90 days, which is usually considered an adequate setting period for the adhesive.

NOTE: Conwed Ceramic Panels will withstand repeated washing as they are unaffected by moisture.

PAINTING ACOUSTICAL MATERIALS

All Conwed acoustical material can be repainted without appreciable loss of acoustical efficiency. Before selecting a paint or applying it, it is important that the painter understand the fundamentals of acoustical tile. All acoustical tile operates on the same principles. They are composed of tiny fibers that absorb the energy of sound waves. The perforations or fissures allow sound waves to enter the body of the acoustical material where they are absorbed.

IT IS IMPORTANT TO AVOID CLOGGING OR BRIDGING THESE HOLES. The openings, of course, take many forms including round holes (large and small), slots, fissures, striations, etc. The painter should not attempt to fill these holes (as he would in painting a plaster wall, for example) but should apply paint to the surface *without* sealing them.

SELECTING A PAINT — Some paint companies recommend specific formulations for acoustical tile which have high "hiding power," low combustibility and are not likely to "bridge" holes in the tile. Where possible, use paint of this type. In all cases paint should be applied in as thin a coat as possible.

It is always a good idea to test the paint on a small area or on a scrap of tile before proceeding. After it has dried, inspect the sample to see if it clogs the openings in your tile or if surface stains bleed through the paint film. If so, or if there is poor adhesion of the paint film to the tile, choose another paint.

There is no evidence to indicate that any particular type of paint — oil base, latex base, or alkyd base for example — is incompatible with acoustical tile. Painters should simply select paint which gives sufficient coverage but does not "bridge" or plug holes in the tile.

CHOOSING A PAINTING METHOD — Brush, roller, or spray methods can be utilized. Select the most practical one for the degree of pattern texture of acoustical material involved in each instance.

EFFECTS OF LIGHTING ON ACOUSTICAL TILE CEILINGS

Acoustical ceiling tile and suspension systems are manufactured with the most up-to-date technology, assuring the highest possible degree of dimensional accuracy. However, certain project design and job site conditions, including suspension system component accuracy and workmanship, together with artificial and natural light sources, all influence and contribute to the final appearance of the ceiling.

This is especially true in the case of square edge acoustical ceiling tile. Low angle lighting from ceiling height windows or certain artificial light sources will accentuate normal manufacturing and installation variations, even when properly installed with the highest quality materials.

notes and references

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When low incident light from surface mounted fixtures, or from ceiling height windows illuminates a joint between two square edge tile, the resulting shadow is far longer than the difference in level between the two tiles. This exaggerates even small variations in level between tile.

Frequently, a ceiling may appear unsatisfactory during installation due to low angle daylight illumination. However, when the job has been completed with draperies or blinds installed and lighting fixtures in operation, the ceiling will provide a commercially acceptable appearance.

This is due to a reduction of the contribution of low angle light to the total light illuminating the ceiling thereby reducing the intensity of shadow exaggerated joints.

The most functional type of fixture for these ceilings is the recessed luminaire. As well as providing excellent illumination, these fixtures eliminate the shadow problems of side lighting and complement the appearance of an acoustical ceiling. If surface mounted fixtures must be used they can be and should be shielded to prevent low-angle light from grazing across the ceiling.

When shadow-casting light cannot be avoided, make sure that the unfavorable light condition exists while the ceiling is erected so the workmen are aware of this condition and can minimize shadowing.

It is recommended that inspection of a ceiling installation be made with the lights turned ON, if this is the normal practice during occupancy. Further, if normal occupancy lighting conditions will result in low angle light being cast across the surface of the ceiling, beveled edge tile should be used.

Even under favorable lighting conditions, some tile surfaces may appear unsatisfactory when installed without bevels. Finely patterned or fissured tile which lack distractive surfaces should be beveled for best total installation appearance.

INSTALLATION METHODS

Most acoustical installations include the complete suspension system which begins with good anchorage to the roof deck system or floor system. Prestretched wire is found to be the best to obtain level ceilings. The placing of wires should not exceed 6' on center. The gauge of the wire should be considered for the loads carried, such as the suspended ceiling itself, recessed or surface mounted light fixtures.

In most projects, 12 gauge hanger wire is adequate for all suspended acoustical ceilings. It requires 394 lbs. before 12 gauge wire will begin to yield. Most mechanics prefer not to use heavier than 12 gauge wire because of the difficulty in bending the wire to obtain a level ceiling. If 12 gauge wire is not ample for ceiling loads, wires should be added at the corners of the light fixtures.

The areas to receive ceilings should be carefully laid out to provide symmetrical borders which are not less than half the size of the tile or panel specified.

Conwed Corporation does not recommend laying thermal insulation directly on the acoustical material.

Any thermal insulation installed on the back of fire-rated board negates the fire rating.

Adhesive Application

This method is limited to 12" x 12" size. Fiber splines shall be installed at all corners of bevel edge Butt K&R tile to assure a level ceiling.

Acoustical tiles may be applied to level surfaces of concrete, plaster or gypsum board. The surface must be cured and dry. Generally, new concrete should cure approximately six months and new plaster should be allowed to dry out four or five weeks.

Do not cement acoustical tile when the room temperature exceeds 100°F or when the room or cement temperature is below 50°F.

NON STANDARD PRODUCT POLICY

The standard product sizes available in each product are listed throughout this brochure. When non-listed (special) items are desired and will be specified, please keep the following minimum order quantities in mind.

For panel products 10,000 square feet. For tile products (any side beveled, kerfed, reveal edges, etc.) 30,000 square feet. Non standard orders are *not* subject to cancellation after production has begun, and up to 5% excess footage may be over-run to cover damage and provide for replacement. Contact your Conwed representative for further information on this subject, and to verify whether your contemplated non-standard is within manufacturing capabilities prior to specification and/or to verify availability.

REFERENCE STANDARDS

Acoustical Board Products Association (ABPA)

Bulletin: Performance Data, Architectural Acoustical Materials. This bulletin is published annually and includes up-to-date information on the projects of association members and types of mounting.

AIMA-I-II, Ceiling Sound Transmission Test by Two-Room Method, determines sound transmission between two adjacent rooms when the path is through the two ceilings and the plenum common to both.

American Society for Testing and Materials (ASTM)

ASTM C 423-66, *Sound Absorption of Acoustical Materials in Reverberation Rooms,* covers the measurement of the sound absorption of acoustical materials in a diffused sound field.

ASTM C 523-68, *Light Reflectance of Acoustical Materials by the Integrating Sphere Reflectometer,* establishes the method for measuring light reflectance of acoustical materials where the application is primarily for predicting the level of room illumination.

ASTM C 367-57, *Strength Properties of Prefabricated Architectural Acoustical Materials,* sets the physical hardness of acoustical materials.

ASTM C 635-69, *Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings,* establishes materials, performance and furring bar suspension systems.

ASTM C 636-69 *Recommended Practice of Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels,* describes procedures for the installation of suspension systems and recommends acceptable tolerances.

ASTM D 1779-65, *Adhesive for Acoustical Materials,* provides specification for, and properties of an adhesive for bonding prefabricated acoustical materials to interior walls and ceilings of rooms.

ASTM E 84-68, *Surface Burning Characteristics of Building Materials,* covers the "tunnel test method" for comparing surface burning characteristics of the materials tested without specific considerations of all the end use parameters that might affect the surface burning characteristics.

ASTM E 119-69, *Fire Tests of Building Construction and Materials,* prescribes a standard exposure fire of controlled extent and severity to determine performance of ceilings, columns, floors and other building members under fire exposure conditions.

Federal Specifications (FS)

FS SS-S-118a, September 15, 1967, *Sound Controlling Blocks and Board (Acoustical Tile and Panels, Prefabricated),* describes the types of boards and tile.

Underwriters' Laboratories, Inc. (U.L.)

Fire Resistance Index, relates to the fire resistance of building assemblies using acoustical materials.

Fire Hazard Classification, provides data in regard to (1) flame spread, (2) fuel contributed, and (3) smoke developed during fire exposure.

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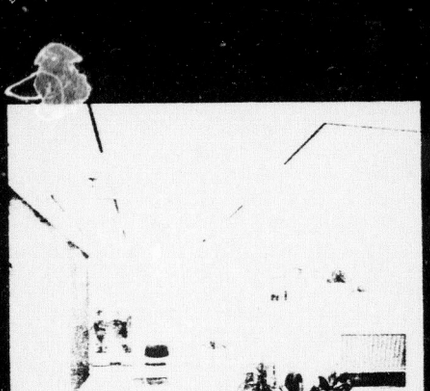
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Form 837-975

Johns-Manville
Sound Control Ceilings

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Sears Tower, Chicago, Illinois. J-M Temper-Tone 360 Tile

Johns-Manville
January 1976

QP 96

ACOUSTICAL TREATMENT
Acoustical Ceilings

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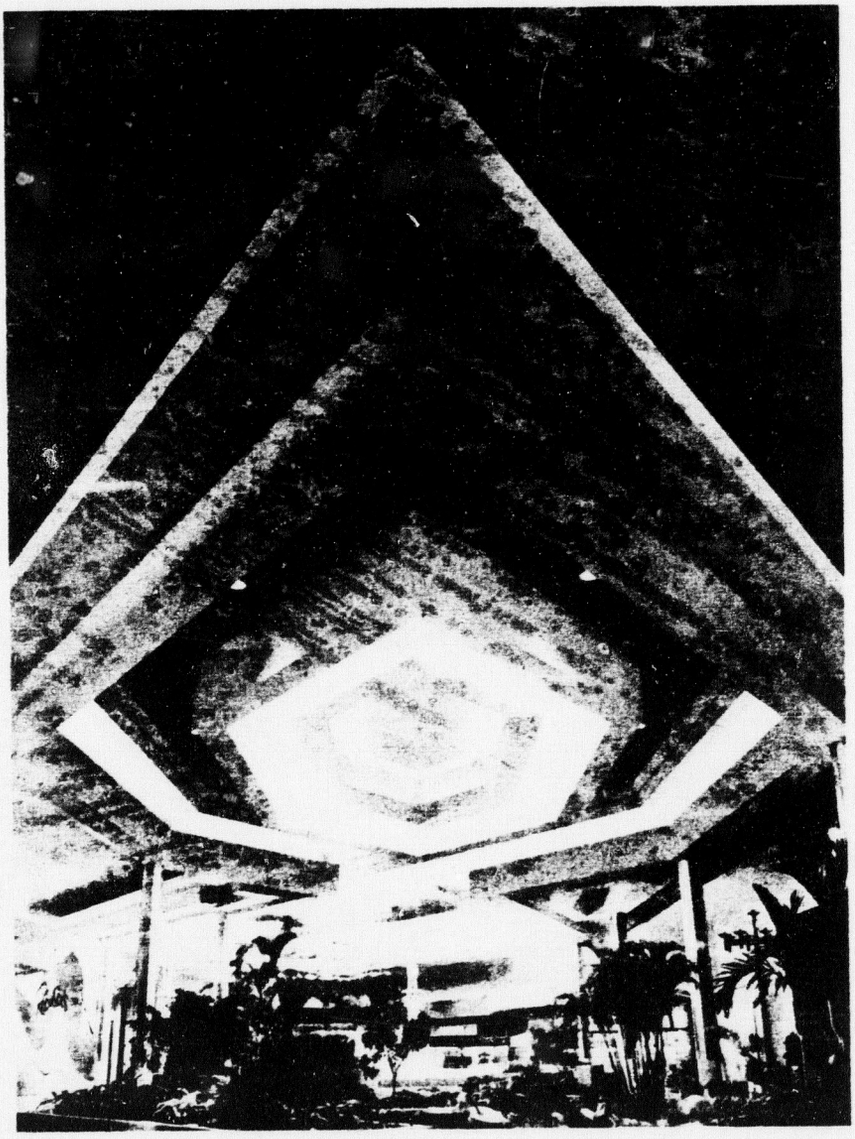
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The physical or chemical properties and all technical data shown in this brochure on Johns-Manville acoustical products represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Check the Johns-Manville Sales Office to assure current information.

Johns-Manville



Johns-Manville, with well over a century's experience in the production of quality building materials, offers an extensive line of specialized sound control products for all sections of industry — commercial, industrial, institutional, residential, and maintenance, repair and remodeling.

J-M has the size, leadership and experience that allows a complete sound control capability, with products and services backed by the full weight of a billion-dollar corporation.

As such, J-M is one of the Dow-Jones Industrials—the 30 companies whose stock values are used to calculate the daily stock market averages. In other words, J-M is recognized as a company whose efforts contribute directly to the health of the American economy.

J-M has manufacturing facilities, distribution centers and sales representatives all over the United States and around the world. Wherever you are, J-M is near you.

In sum, J-M has the people, the facilities, the products, and the know-how to provide you with the finest ceiling materials available.

This catalog is a brief review of the functions a non-residential ceiling is designed to perform and the Johns-Manville products and systems that perform them so well.

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Sound Control Ceilings



General Information

Today a ceiling is far more than the underside of the roof or of the floor above.

A ceiling, and the space above it, are required to perform many functions — control sound, provide light, provide fire safety, handle and distribute conditioned air, provide thermal insulation, and highlight specialty areas. In addition, since the ceiling is a visual feature of a building's interior, and therefore a design element, ceiling products must offer the designer flexibility to meet even the most innovative and creative criteria.

With its extensive experience in producing quality building materials, Johns-Manville offers a broad range of sound control ceiling materials as well as entire systems — providing the architect and designer with practical solutions to problems of sound control, ventilation, thermal insulation, lighting, fire safety and aesthetics in interior space design.

Sound Absorption

Sound control is an essential in almost any structure. Absorption of sound that originates within a room or building is a vital part of sound control. Since most interior surfaces — walls, floors, windows — are "hard", these generally absorb a very small percentage of sound and reflect the balance back into the room.

Ceiling materials, however, are formulated and designed to absorb and otherwise control sound. They are made-to-order sound absorbers.

All J-M ceiling products are tested for sound absorption in accordance with procedures set forth by American Society For Testing Materials test number C423-66. The test results are expressed as NRC (Noise Reduction Coefficient) for a particular product with a particular standard mounting.

The common types of mountings used in conducting sound absorption tests and illustrated in the latest Acoustical and





Board Products Association (ABPA) Bulletin are:

1. Cemented to solid surface.
2. Applied to wood furring 12" on center.
4. Laid directly on laboratory floor.
5. Applied to wood furring 24" on center with 1" mineral wool between furring.
7. Suspended by metal tees.

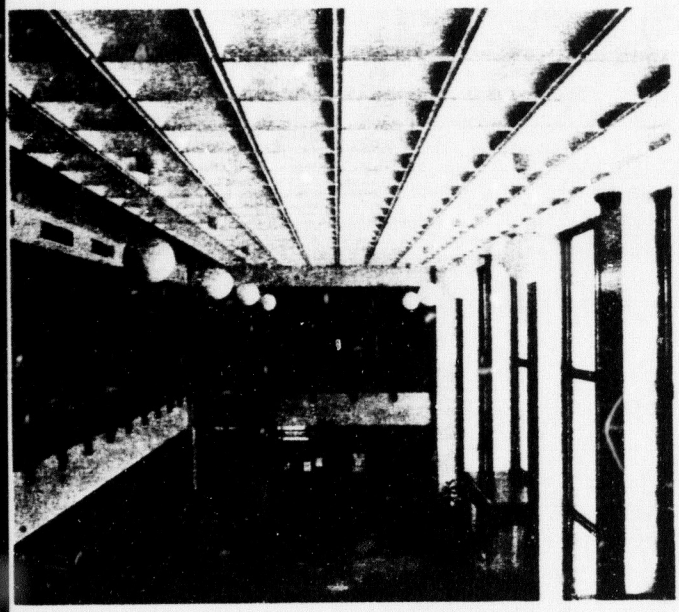
NRC is expressed to the nearest multiple of .05 and ABPA recommends listing each material in a 10-point range. The higher the NRC range, the better the sound absorption of the material. However, differences between adjacent 10-point ranges in completed installations are minor and should not be over-emphasized.

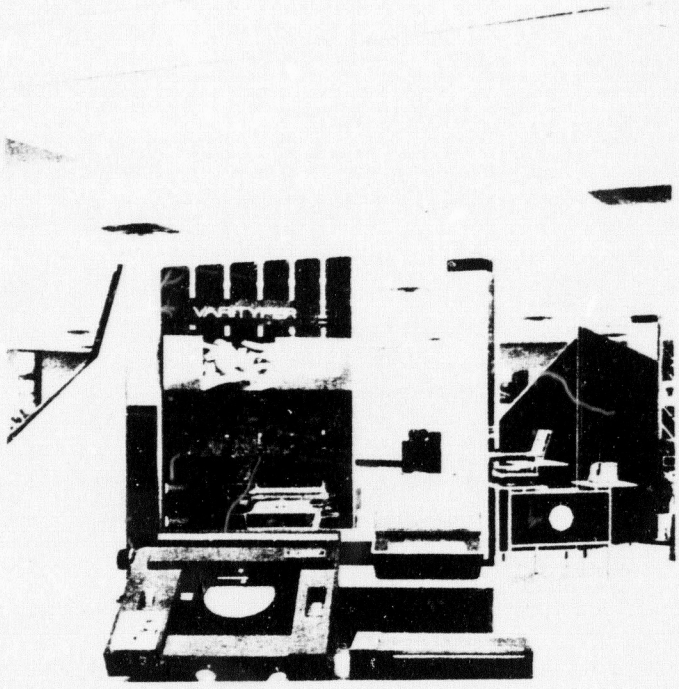
Sound Attenuation

Most interior construction today is characterized by suspended ceilings, in which a continuous plenum extends over two or more rooms or areas which are separated only by ceiling-high partitions. Transmission of sound through the ceiling and plenum to adjacent areas can be a serious problem.

Ceiling materials are therefore required to reduce or prevent the transmission of unwanted sound between areas. Testing of sound transmission reduction (or attenuation value) is measured by ABPA procedures and expressed as STC (Sound Transmission Class). STC is reported in 5-point ranges. The higher the STC range, the better the sound attenuation of the material.

Sound Control Ceilings





Flame Spread
The rate at which a flame will travel across an exposed surface is called "flame spread" and is a guide to the relative flammability of a material. It is measured by the Tunnel Test Method (American Society for Testing and Materials Standard E-84) and is reported in several classes, with the lowest and most favorable numerical rating being Class 25, or a flame spread rating of 0-25.

Fire Endurance
The second criterion for the fire safety of a material is its ability to prevent the transmission of the heat of a fire and the penetration of flame through it to other members of a construction system. In this respect, acoustical materials are in an ideal position to act as the principal fire protection barriers of roof or floor and ceiling systems. Time-rated designs for fire-resistant constructions are listed in the Underwriters' Laboratories, Inc., Fire Resistance Index. Details of time-rated constructions employing J-M acoustical materials are shown in the Firedike section of this catalog.

Many J-M mineral fiber tiles and panels are available as Firedike, specially-formulated for extra fire safety and rated for specific use in time-rated designs.

Light Reflectance
All Johns-Manville acoustical tiles and panels are designed to afford excellent light reflectance. High reflectance cuts power requirements and provides better vision. Most J-M acoustical products bear the designation "75% or greater" when tested in accordance with ASTM C523-68 and "LR-1" under Federal Specification SS-S-118A. Both are the highest ratings available.

Thermal Insulation
Acoustical ceiling materials can make an important contribution to the thermal insulation values of roof/ceiling systems, as well as lowering heating and cooling costs by resisting the flow of heat into or out of conditioned rooms and areas. The "R" values of specific J-M tiles and panels will be found in the data charts on page 43 of this catalog.

In addition, see the pages on J-M Thermal Acoustical Batts and Sound Control Blankets, two products having



excellent acoustical characteristics as well as extremely efficient thermal insulation values.

Access
The plenum above suspended ceilings is seldom empty, but usually contains the duct work, piping, wiring, lighting fixtures, and all the other service components vital to building operation. Access to the plenum and its contents is vital to keep all of these components in proper working order.

All J-M lay-in panel ceilings permit complete access to the plenum. There are many systems of mounting J-M ceiling tiles to permit complete or spot access. Of particular interest is Temper-Tone 360 Access Tile which gives instant access without tools, and without destroying the monolithic appearance of the rest of the ceiling when used as a concealed suspension system.

Felted Mineral
J-M felted mineral fiber tile and panels are based on a composition primarily of inorganic fibers tightly bonded together by a wet felting process. The resultant tile and panel base is rigid and durable and, when suitably finished with a decorative coating and fissured and/or perforated, functions as an attractive acoustical unit.

Metal Faced
J-M offers two metal faced ceiling products:
Acousti-Clad Tile. Cores for these tiles have a specially-formulated felted mineral composition. Facing is of aluminum, finished with a durable, baked-on, high molecular weight polymer coating.

Duratone Panels. This product combines a wet felted mineral composition core with a facing of vinyl-faced, fiber glass reinforced aluminum composite which imparts easy cleaning and unusual abuse resistance.

Fiber Glass
J-M fiber glass products are composed of long, fine, glass fibers made by a unique flame attenuation process. These fibers are bonded together by thermo-setting resins. J-M SpanAcoustic and SpanCore panels are faced with a textured, non-breathing vinyl film. Sculptured fiber glass panels are three dimensional with the fiber glass compressed and molded under heat and pressure. The textured finish is a white vinyl paint.

197 a

Temper-Tone®

Felted Mineral Fiber Tiles

A top-quality, high performance tile with a distinctive, highly-styled appearance.



Description
J-M TEMPER-TONE TILES are felted mineral fiber tiles with patterns of directional or non-directional fissures combined with small perforations, including the widely accepted *360* non-directional fissured pattern. High density, non-breathing construction makes them ideal for use with return air plenum designs. Their very high sound attenuation values (up to STC 45-49) substantially reduce the transfer of sound from room to room through continuous ceilings. Temper-Tone tiles are made in three decorative surface patterns. In addition to beveled edge tiles, square edge tiles are available in the 360 pattern. With square edges, joints virtually disappear for a monolithic ceiling appearance.

Recommended Uses
Temper-Tone tiles combine good sound absorption, excellent sound attenuation and dimensional stability with dramatic good looks. As such, they can be used wherever a monolithic ceiling effect is desired, and are especially appropriate in schools, retail shops and office structures with movable partition systems.

Surface Patterns
Temper-Tone tiles are available in a choice of three distinct patterns that will complement any interior decor. *360* pattern features bold fissures while *720* relies on a subtle, random pattern of small non-directional fissures. *DCF* is distinctive for its directionally oriented fissures.

Finishes
Temper-Tone tiles are available with a Standard White vinyl paint finish. An additional acrylic CPO (Clear Plastic Overspray) is optional.

Light Reflectance
75% or greater (ASTM C523-68)
LR-1 (Fed. Spec. SS-S-118A)

Flame Spread
Temper-Tone tiles are rated Class 25 under the Flame Spread Index of Federal Specification SS-S-118A. They have a flame spread rating of 0-25 according to ASTM E-84, Tunnel Test Method and carry the U.L. Fire Hazard Classification Label.*

Fire Endurance
All Temper-Tone tiles including Temper-Tone Ventilating Tiles are available as Firedike in 12" x 12" and 12" x 24" x ¾" or ⅝" for fire-rated ceiling systems. For details of U.L. time-rated constructions see the Firedike section of this catalog.

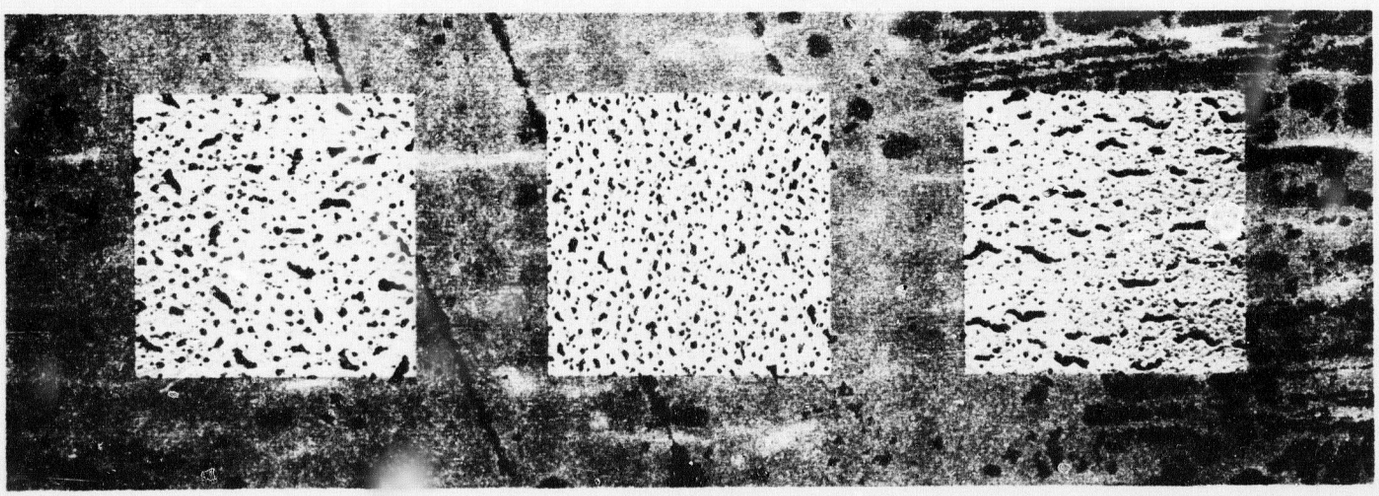
Ceiling Accessibility
Temper-Tone 360 Access Tile is a variation of Temper-Tone 360 with a special edge design. It permits removal and reinstallation for above-ceiling accessibility, yet is visually identical to standard Temper-Tone 360. (See Access Ceilings section of this catalog.)

Ventilating Ceilings
For ventilating ceilings, these tiles are available through-perforated in the 360 pattern as Temper-Tone Ventilating Tiles. Air passage capabilities are up to 12.4 C.F.M. per sq. ft. at a plenum pressure of 0.10 p.s.i. of water.

Installation
Temper-Tone tiles can be mounted with standard concealed or semi-concealed suspension systems. 12" x 12" BE KCB-4 tile can also be cemented.

Sizes and Edge Details
12" x 12" x ¾" BE TGK, BE KCB-4. SE TGK (360 pattern only)
12" x 12" x ⅝" BE TGK, SE TGK (Firedike 360 pattern only)
12" x 24" x ¾" BE ACCESS, BE KCB-4
12" x 36" x ¾" BE ACCESS
12" x 23⅞" x ¾" BE KCB2L

*This numerical flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.



Tenu-Tone®

Felted Mineral Fiber Tiles

Good quality, general purpose tiles combining performance with economy.



Johns-Manville

Description
J-M TENU-TONE TILES are good quality, felted mineral fiber tiles. Their combination of high sound absorption, good sound attenuation, dimensional stability and pleasing surface patterns makes these tiles an ideal choice when good performance must be balanced with low initial cost.

Recommended Uses
Tenu-Tone tiles combine good sound absorption, excellent sound attenuation and dimensional stability with dramatic good looks. As such, they can be used wherever a monolithic ceiling effect is desired, and are especially appropriate in schools and institutions, retail shops and office structures with movable partition systems.

Surface Patterns
Tenu-Tone tiles come in five patterns for extra variety and design opportunity. *Omni, Concord, Pierced, Uniform Punched* and *Random Punched* each lend a unique appearance to any room in which they are used.

Finishes
Tenu-Tone tiles are available with a Standard White vinyl paint finish. An additional acrylic CPO (Clear Plastic Overspray) is optional.

Light Reflectance
75% or greater (ASTM C523-68)
LR-1 (Fed. Spec. SS-S-118A)

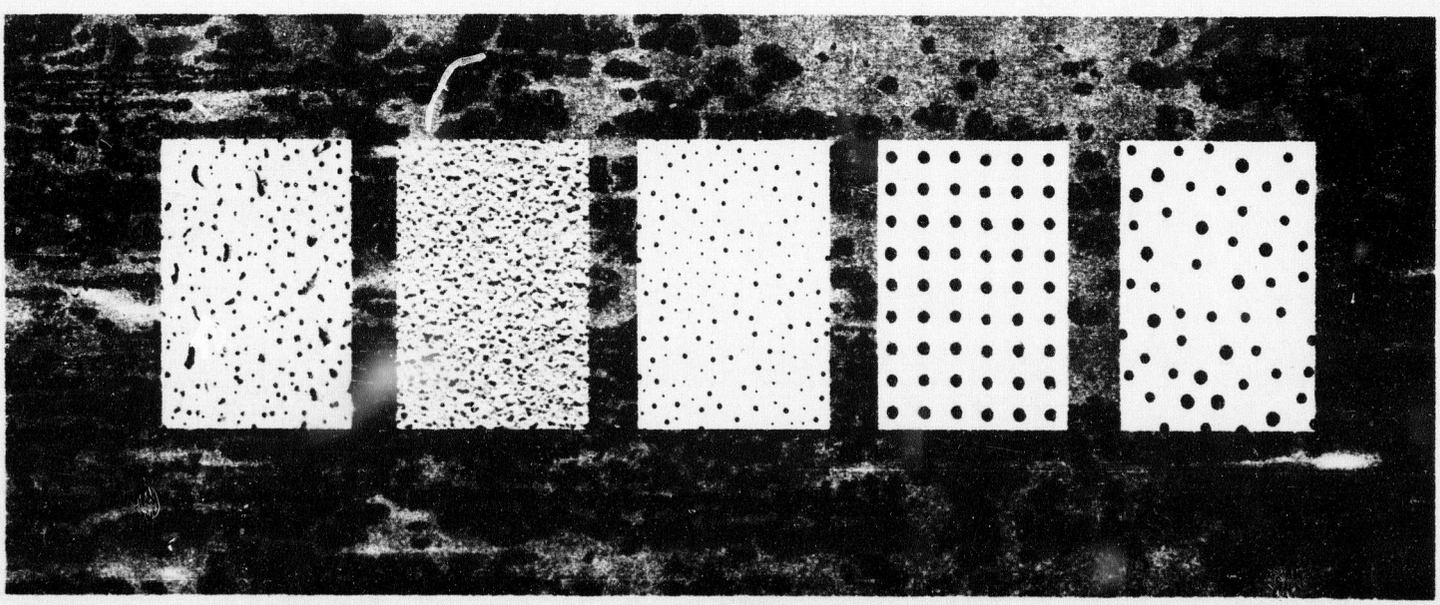
Flame Spread
Tenu-Tone tiles are rated Class 25 under the Flame Spread Index of Federal Specification SS-S-118A. They have a flame spread rating of 0-25 according to the ASTM E-84, Tunnel Test Method and carry the U.L. Fire Hazard Classification Label.*

Fire Endurance
Omni, Concord, and Pierced Tenu-Tone tiles are available as Firedike for fire-rated ceiling systems. For details of U.L. time-rated constructions see the Firedike section of this catalog.

Installation
Tenu-Tone 12" x 12" tiles can be cemented to concrete, plaster or gypsum board. They can also be mounted with standard concealed or semi-concealed suspension systems.

Sizes and Edge Details
Tenu-Tone tile is made with a 1/16" bevel. The Omni is also available with square edges for a monolithic ceiling appearance. The following sizes and edge details are standard (other sizes are available on special order):
12" x 12" x 5/8" BE KCB-4
12" x 12" x 5/8" BE TGK
12" x 12" x 5/8" SE TGK (Omni pattern only).

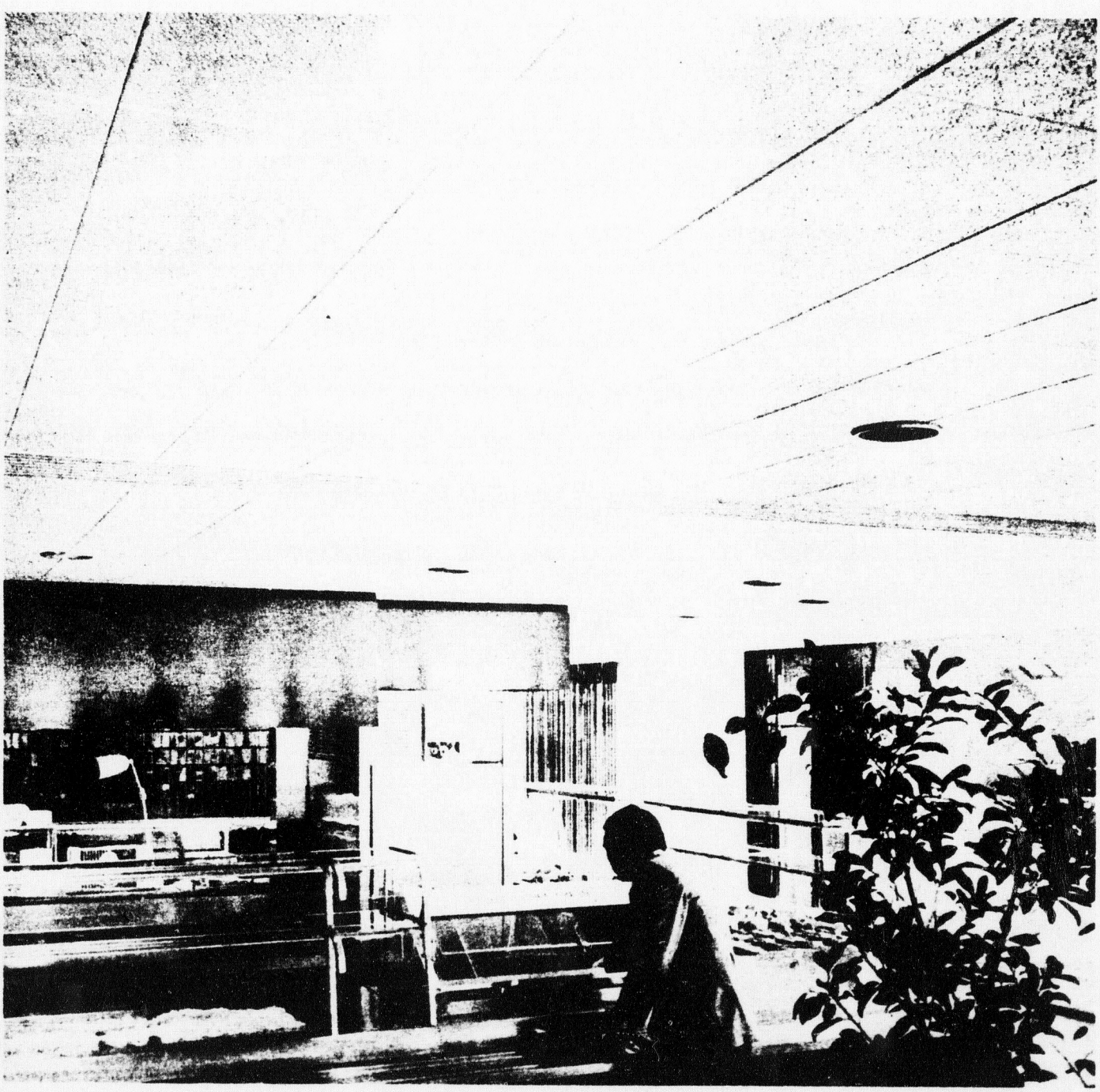
* This numerical flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.



Acousti-Clad®

Aluminum-Clad Felted Mineral Tiles

Made to order for ceilings where moisture, cleanliness and fire safety are essential.



Description
J-M ACOUSTI-CLAD TILES are unique, factory fabricated units that combine a rigid, dimensionally stable, sound-control core with aluminum cladding. They can be either suspension-mounted or cemented in place.

The aluminum cladding makes for quick, easy cleaning and durability, as well as contributing to fire safety. Three surface patterns and three core materials are available.

Available in a choice of colors, Acousti-Clad tiles also offer important economies. Life cycle costs are low because they have an easy maintenance, durable surface that is easily cleaned time after time without affecting their outstanding appearance or sound control properties.

Recommended Uses
Acousti-Clad tiles are easy to clean and maintain and are most suitable for use in health and medical facilities, food preparation areas, restrooms and locker rooms, high humidity areas (Perlite Core), data processing and computer rooms and educational facilities or high impact resistant areas.

Surface Patterns
Delta is a pattern of small, random-sized, non-directional perforations that de-emphasize the tile joints. *Random* has larger, bolder, random, non-directional perforations. *Diagonal Perforated* is a traditional pattern of small, uniform perforations in diagonal rows.

Core Materials
Each Acousti-Clad tile has a rigid, mineral based core in one of three specialized formulations.
Perlite Core is a rigid, cellular combination of expanded perlite, mineral binders and fibers. It is highly resistant to airborne moisture and has an exceptionally high sound attenuation value (up to STC 45-49). Available in Diagonal Perforated and Random patterns only.
Felted Mineral Core is a rigid, monolithic mineral fiber construction with a high degree of sound absorption. Available in all three surface patterns.
Firedike® Core is a special mineral fiber core. Firedike is classified by Underwriters' Laboratories for 2 hour and 1½ hour fire resistant floor and ceiling assemblies. Available in all three surface patterns.

Finishes
Acousti-Clad tiles are available in a choice of White, Gold, Silver and Copper color coatings. The coatings are baked, high-molecular weight resins and are extremely durable, light reflectant and fade-resistant. They are highly resistant to heat, humidity and grease, and won't chip, crack or peel.

Light Reflectance
70%-74% (ASTM C523-68)
LR-2 (Fed. Spec. SS-S-118A)

Flame Spread
Acousti-Clad tiles are rated Class 25 under the Flame Spread Index of Federal Specification SS-S-118A. They have a flame spread rating of 0-25 according to ASTM E-84, Tunnel Test Method and carry the U.L. Fire Hazard Classification Label.*

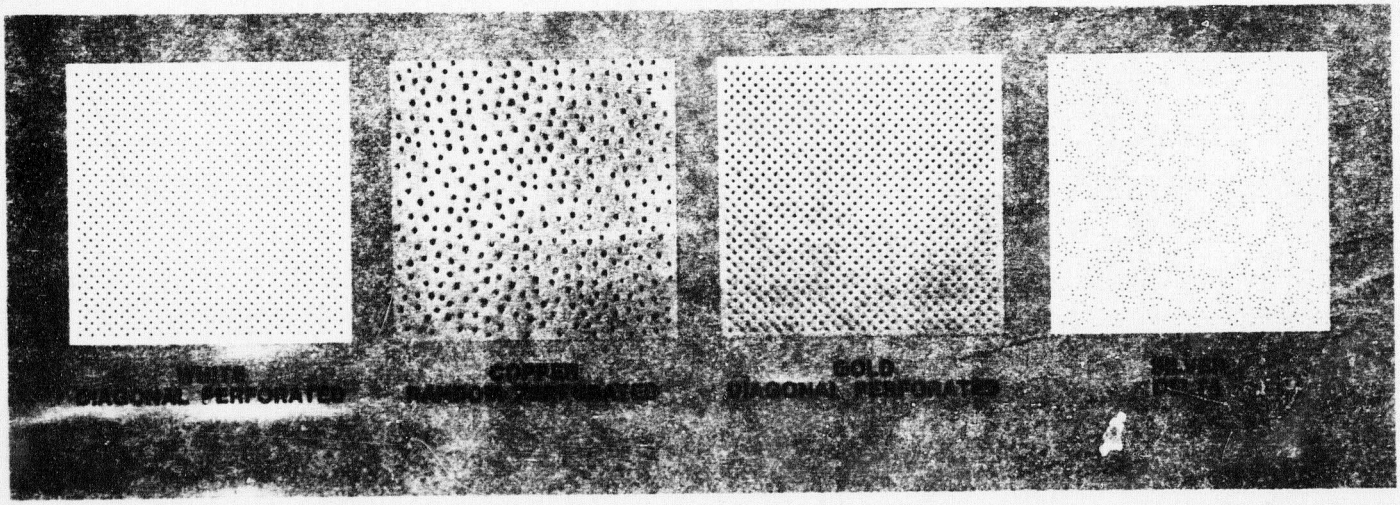
Fire Endurance
Acousti-Clad tiles with Firedike cores carry the U.L. Fire Resistance Classification Label.

Ceiling Accessibility
When used with a suspension system, Acousti-Clad tiles can be used for above-ceiling access with the addition of simple access components.

Installation
Acousti-Clad tiles can be mounted with standard concealed suspension systems or they can be cemented to any suitable concrete slab, plaster or gypsum board. *However, adhesive manufacturers generally caution against the use of their products in high humidity areas.*

Sizes and Edge Details
Acousti-Clad Perlite Core, 12" x 12" x ⅞", KCB-4. Acousti-Clad Felted Mineral Core and Firedike Core, 12" x 12" x ⅝" KCB-4.

* This numerical flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.

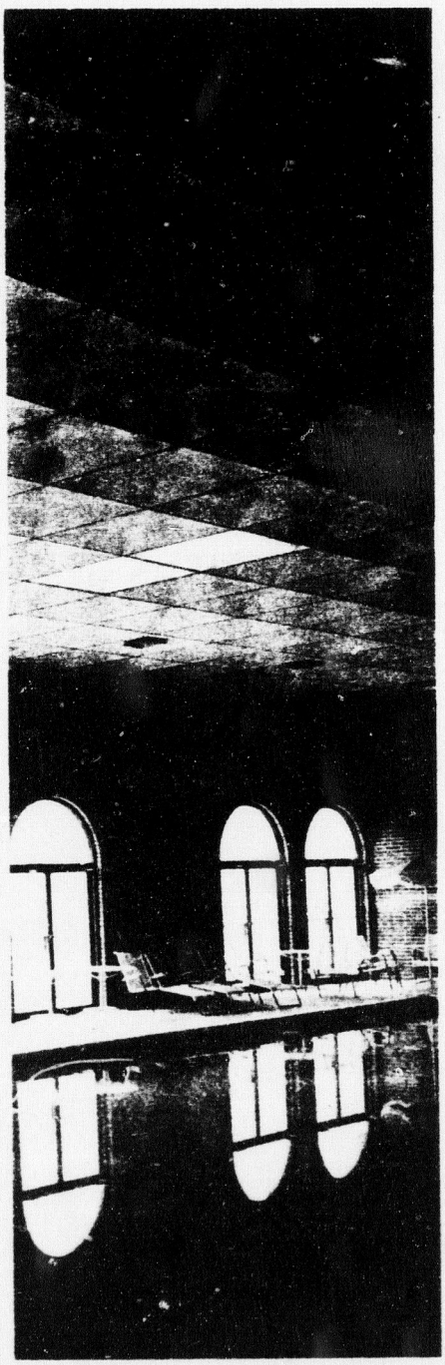


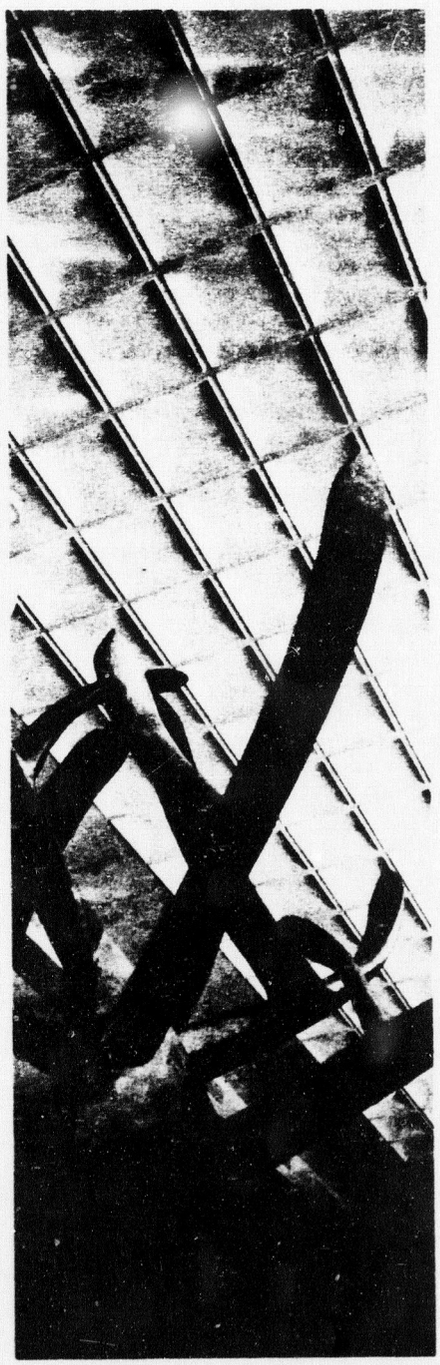
Sculptured Fiber Glass Panels

For Three-Dimensional Ceilings

Offering unique design opportunities for malls, all highlight areas.







Description
J-M SCULPTURED FIBER GLASS LAY-IN PANELS are three dimensional units made of compressed, heat molded glass fibers with a textured white paint finish.

They have deep, boldly sculptured contours that emphasize rather than hide the ceiling.

Besides strength, rigidity and light weight, sculptured fiber glass lay-in panels also have excellent sound absorption characteristics.

These panels are made in four distinctive styles, each with its own power to impart an impressive character to the areas it serves.

Recommended Uses
J-M Sculptured Fiber Glass Lay-In Panels can be used alone or in combination with other ceiling treatments, for entire rooms or to visually set off specific areas.
They are suitable for enclosed malls, executive suites and general office areas, reception and conference rooms, supermarkets, retail sales areas and other expansive areas where ceilings can be emphasized to form a major design element.
Side and edge lighting can be used to deepen the sculptured appearance of these ceilings.
Sculptured Fiber Glass Panels should not be used where reduced air pressure exists in the plenum.

Surface Patterns
Prismatic Panels are the newest addition to the J-M Sculptured Fiber Glass Lay-In Panel group of products. Pebble-surfaced, with a white painted finish, each square panel has a pattern consisting of a tilted diamond flanked by four triangular facets. The total panel depth of 8" has a maximum projection above and below the ceiling plane of 4". An almost endless array of solid, prismatic, geometrical shapes can be produced in the ceiling, according to the direction or combination of directions in which the panels are arranged and the lighting employed. Flat panels are used for borders, fixture and vent panels.

Profile Panels have a smooth, white painted surface. They have a curved vault shape 3¼" deep, with a reveal edge projecting below the grid which allows the apex of the vault to be only 2½" above the grid. The reveal also adds a strong, recessed grid pattern to the appearance of the ceiling.
Profile Flat panels are used in combination with regular Profile panels as cut borders or where fixtures and vents are installed in the ceiling.

Acousti-Shell Panels are made in two sculptured patterns, each with a strongly textured, white painted surface:

Textured Vault panels have a modified pyramidal shape with an apex 2" above the grid in the 2' square units, 3" in the 4' square units.
Textured Coffer panels are square or rectangular units which project below the grid 1", forming an interesting pattern of recessed grid separations.
Textured Flat panels are used in combination with the above panels as cut borders or where fixtures and vents are installed in the ceiling.

Finishes
J-M Sculptured Fiber Glass Lay-In Panels are available with a Standard White vinyl paint finish.

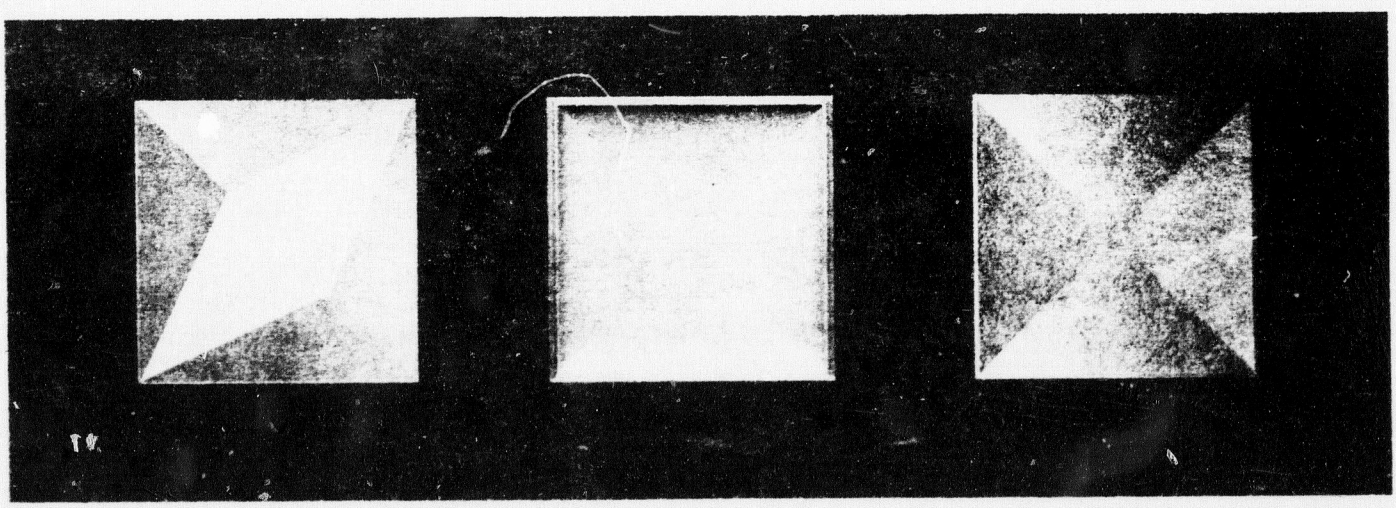
Light Reflectance
75% or greater (ASTM C523-68).
LR-1 (Fed. Spec. SS-S-118A).
Light reflectance for Profile panels is an extremely high 92%.

Flame Spread
J-M Sculptured Fiber Glass Lay-In Panels are rated Class 25 under the Flame Spread Index of Federal Specification SS-S-118A. They have a flame spread rating of 0-25 according to ASTM E-84, Tunnel Test Method and carry the U.L. Fire Hazard Classification Label.*

Installation
J-M Sculptured Fiber Glass Panels lay in standard exposed grid suspension systems. Where excessive air movement is anticipated, hold down clips may be required.

Sizes		Size
Product	**Pattern**	**(Nominal)**
Acousti-Shell	Vault	24" x 24", 48" x 48"
Acousti-Shell	Coffer	24" x 24", 24" x 48"
Acousti-Shell	Flat	24" x 24", 24" x 48", †48" x 48"
Profile	Reveal Edge	24" x 24"
Profile Prismatic	Flat	24" x 24", 48" x 48"
Prismatic	Flat	†48" x 48"

†Requires supplemental support.
* This numerical flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.

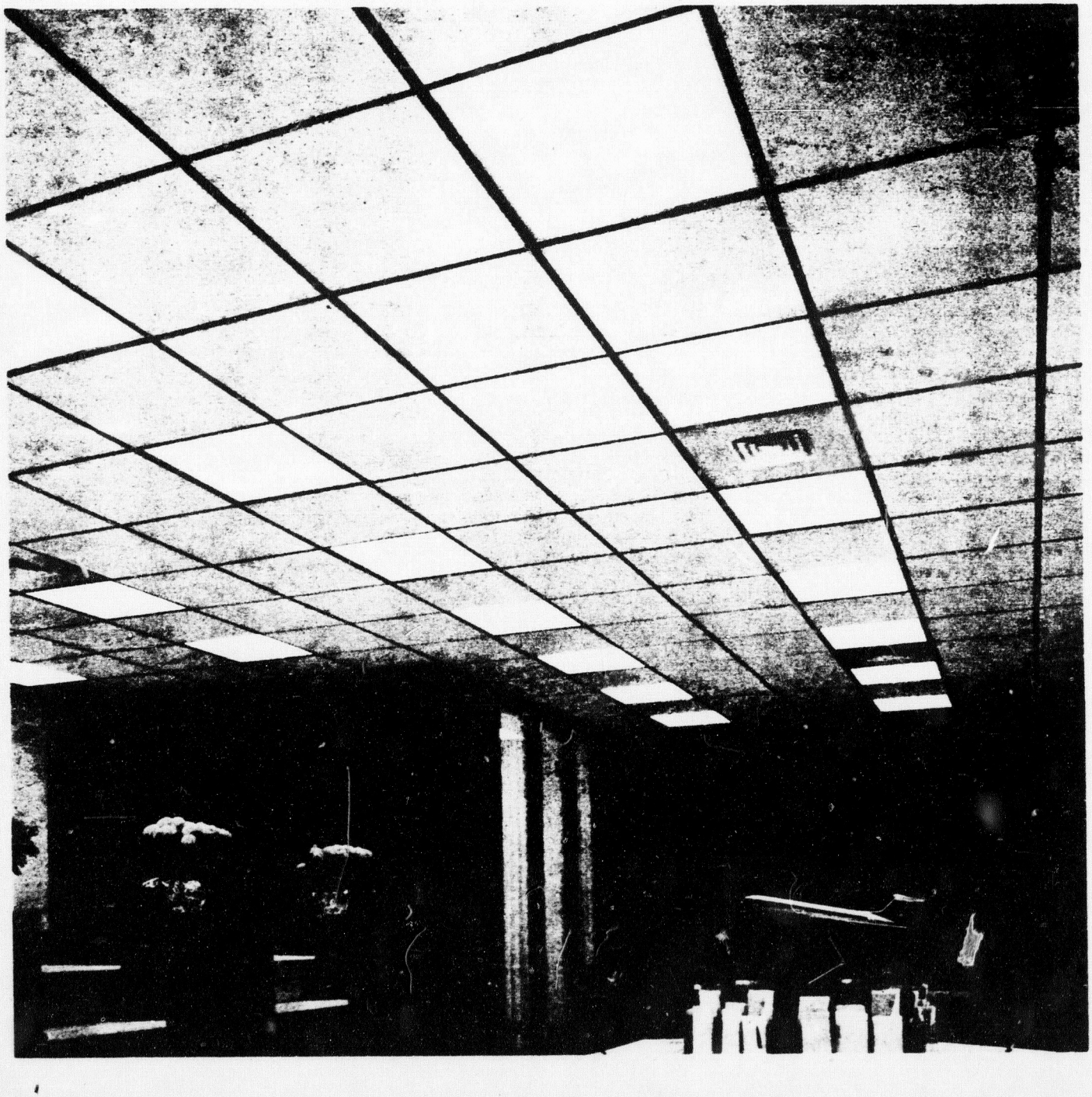


205 a

Quadrette®

Felted Mineral Fiber Reveal Edge Panels

Designed with reveal edges to create a bold, three-dimensional ceiling surface.



Johns-Manville

Description
J-M QUADRETTE PANELS are mineral fiber ceiling panels that are designed for installation in exposed grid systems. The unique reveal edges on Quadrette panels allow the panel surface to drop below the level of the grid system, creating a bold, three-dimensional ceiling surface.

Recommended Uses
Quadrette panels are ideal for use in prestige office buildings, lobbies, retail stores, schools and other areas where outstanding ceiling design and appearance will complement the remainder of the building interior. The three-dimensional "reveal" effect emphasizes the ceiling plane and turns an ordinary ceiling into an important design element.

Surface Patterns
Quadrette panels have an open pattern of non-directional, random-sized fissures combined with small perforations. The Quadrette panels pattern is completely compatible with J-M Spintone *360* lay-in panels, Firedike *360* lay-in panels, and Tenu-Tone *Omni* tiles.

Finishes
Quadrette panels are available with a Standard White vinyl paint finish. An additional acrylic CPO (Clear Plastic Overspray) is optional.

Light Reflectance
75% or greater (ASTM C523-68)
LR-1 (Fed. Spec. SS-S-118A)

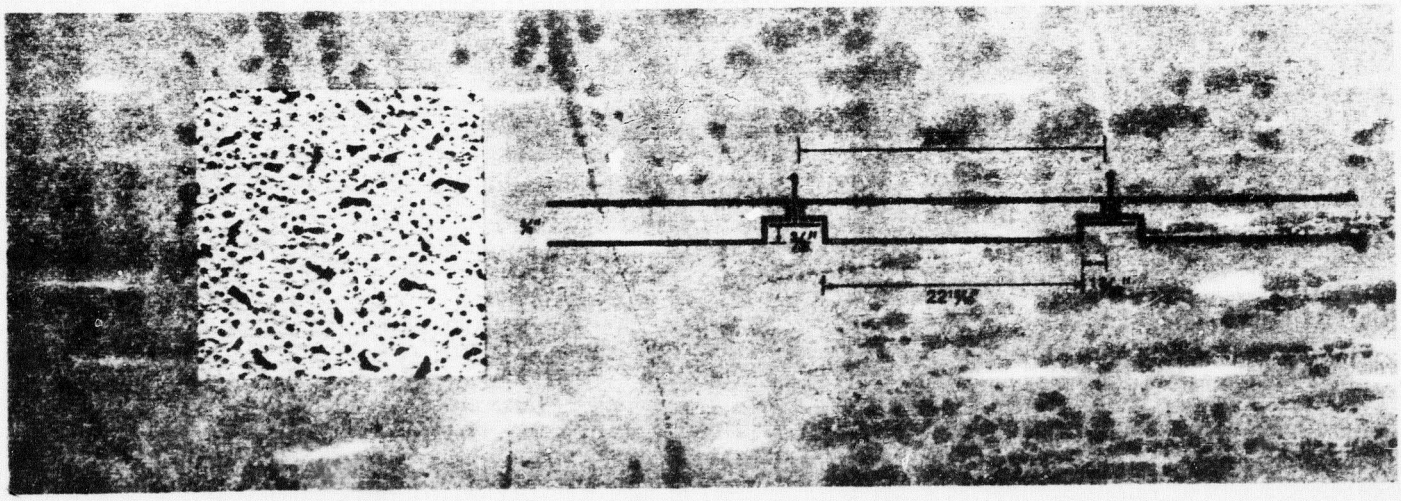
Flame Spread
Quadrette panels are rated Class 25 under the Flame Spread Index of Federal Specification SS-S-118A. They have a flame spread rating of 0-25 according to ASTM E-84, Tunnel Test Method and carry the U.L. Fire Hazard Classification Label.*

Fire Endurance
Quadrette Firedike panels carry the U.L. Fire Resistance Classification Label in 2′ x 2′ sizes. For details of U.L. time-rated constructions, see the Firedike section of this catalog.

Installation
Quadrette panels are designed to lay-in to standard and time-rated exposed grid systems.

Sizes and Edge Details
All four edges of Quadrette panels are revealed, creating a three-dimensional effect. The following sizes are standard (other sizes available on special order):
23¾″ x 23¾″ x ⅝″
(available in Firedike)
23¾″ x 23¾″ x ¾″
(available in Firedike)
23¾″ x 47¾″ x ⅝″
23¾″ x 47¾″ x ¾″

* This numerical flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.



207 a

Spintone®

Felted Mineral Fiber Lay-In Panels

Combining beauty and economy for practical ceilings.



Johns-Manvill

Description
J-M SPINTONE PANELS are high quality general-purpose, felted mineral fiber lay-in panels. They are made in a wide range of fissured, pierced and textured patterns all with high sound attenuation and noise control properties. They are available in sizes up to 30″ x 60″ and allow complete access to the plenum.

Spintone panel ceilings are not only attractive, they are extremely practical and economical in both original and replacement costs.

Recommended Uses
The large variety of patterns and sizes, cleanability and good acoustical properties make Spintone panels suitable for a wide range of applications in modern structures such as schools, stores and other commercial buildings. The sound attenuation values (up to STC 40-44) which minimize transfer of sound from room to room through the ceiling plenum, make them particularly suitable for use in high-rise offices and schools with movable ceiling-high partitioning systems.

Surface Patterns
Spintone panels are available in a coordinated group of five handsome surface patterns that are sure to fill a broad range of design requirements. No matter what visual effect you may desire, there's a design that makes it simple to accomplish. If your plans are best suited by the monolithic character of crisp, non-directional fissured styling, these J-M panels offer you a choice of bold *360* or muted *720* patterns. If you prefer a directional fissured design that is out of the ordinary, *DCF* should be your choice. Or you can select one of the distinguished perforated patterns, *Concord* or *Pierced.*

Finishes
Spintone panels are available with a Standard White vinyl paint finish. An additional acrylic CPO (Clear Plastic Overspray) is optional.

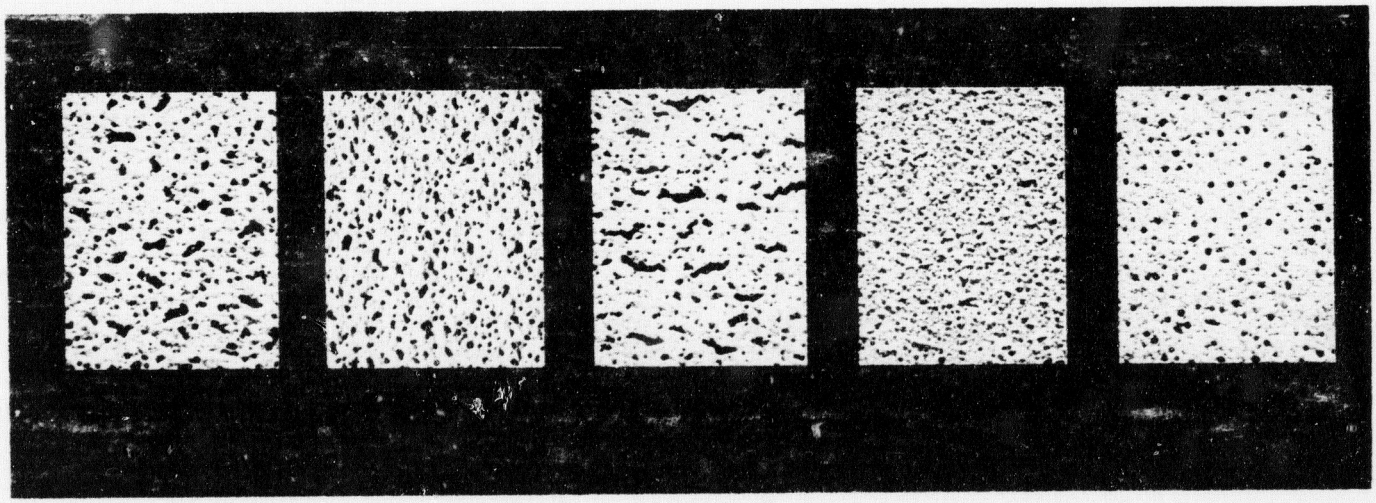
Light Reflectance
75% or greater (ASTM C523-68)
LR-1 (Fed. Spec. SS-S-118A)

Flame Spread
Spintone panels are rated Class 25 under the Flame Spread Index of Federal Specification SS-S-118A. They have a flame spread rating of 0-25 according to ASTM E-84, Tunnel Test Method and carry the U.L. Fire Hazard Classification Label.*

Installation
Spintone panels lay in on standar exposed grid suspension systems an allow complete accessibility to th plenum.

Sizes and Edge Details
Spintone panels are made in squa edge only in the following nomin sizes (other sizes are available c special order):
24″ x 24″ x 5/8″
24″ x 36″ x 5/8″
24″ x 48″ x 5/8″
24″ x 60″ x 5/8″

*This numerical flame spread rating is not i tended to reflect hazards presented by th or any other material under actual fire co ditions.



209 a

Duratone™

Aluminum-Faced Felted Mineral Fiber Lay-In Panels

An attractive, practical panel combining sound control, easy maintenance and high acoustical efficiency.



Johns-Manville

Description
J-M DURATONE PANELS are factory fabricated lay-in panels that combine the rigid, dimensionally stable, felted mineral fiber of J-M Spintone panels with a vinyl surfaced, fiber glass reinforced aluminum facing.

The aluminum facing promotes easy cleaning and maintenance, gives excellent durability and contributes to fire safety. The fiber glass reinforcement provides increased strength and dimensional stability.

Duratone is the preferred choice of lay-in panels for areas requiring excellent acoustical properties and an easily cleaned, rugged, extra-durable surface. Life cycle costs are low because maintenance and upkeep are minimized.

Recommended Uses
The easy-cleaning, durable surface makes Duratone lay-in panels a good choice for many uses:

- Nursing homes and hospitals where good sanitation and ease of maintenance are required.
- Commercial kitchens and food handling and processing areas where ceiling surface moisture damage, odor absorption and airborne grease are a problem.
- Educational areas which need durable, easily maintained surfaces with abuse resistance and fire safety.

Surface Patterns
Duratone panels combine the pleasing, random, subtle texture from the underlying fiber glass reinforcement with a lightly pebbled surface treatment. They are available in two patterns: *Duratone Pierced* has a pattern of random-sized, randomly-spaced perforations. *Duratone Unperforated* has a smooth surface except for the subtle texture described above. The Duratone Unperforated panel has been approved for use in Federally inspected meat and poultry plants by the U.S. Department of Agriculture, Animal and Plant Health Inspection Service.

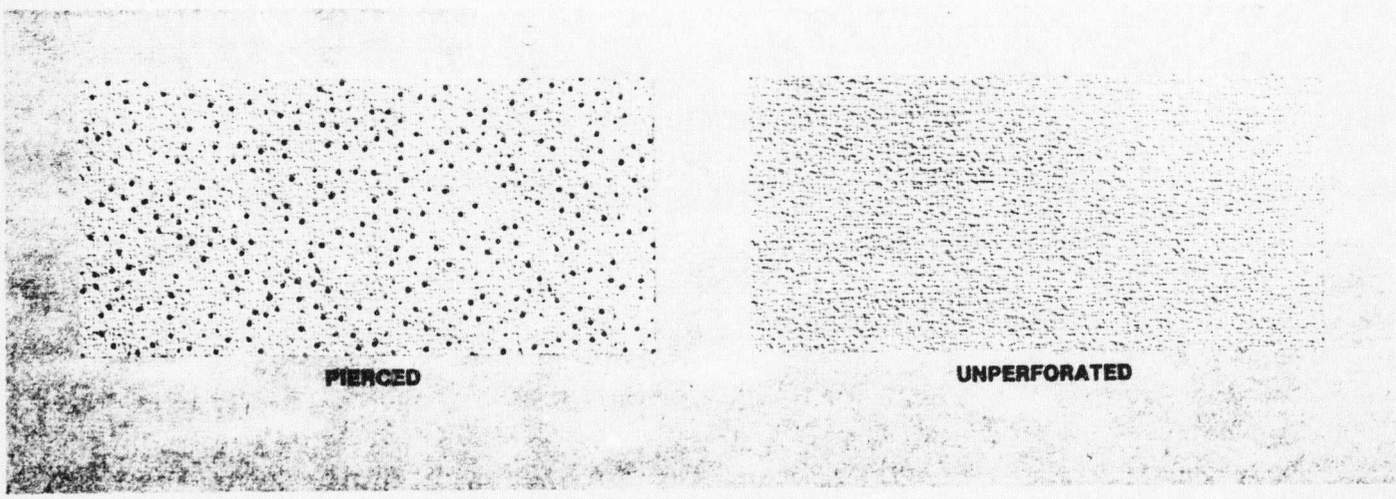
Finishes
Duratone panels have a vinyl surfaced, fiber glass reinforced aluminum facing.

Flame Spread
Duratone panels are rated Class 25 under Flame Spread Index of Federal Specification SS-S-118A. They have a flame spread rating of 25 according to ASTM E-84, Tunnel Test Method.*

Installation
Duratone panels lay in on standard exposed grid suspension systems. Installation is fast and allows complete accessibility to the plenum.

Sizes and Edge Details
Duratone panels are made in square-edge only in the following nominal sizes (other sizes are available on special request):
24" x 24" x 5/8"
24" x 48" x 5/8"

*This numerical flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.



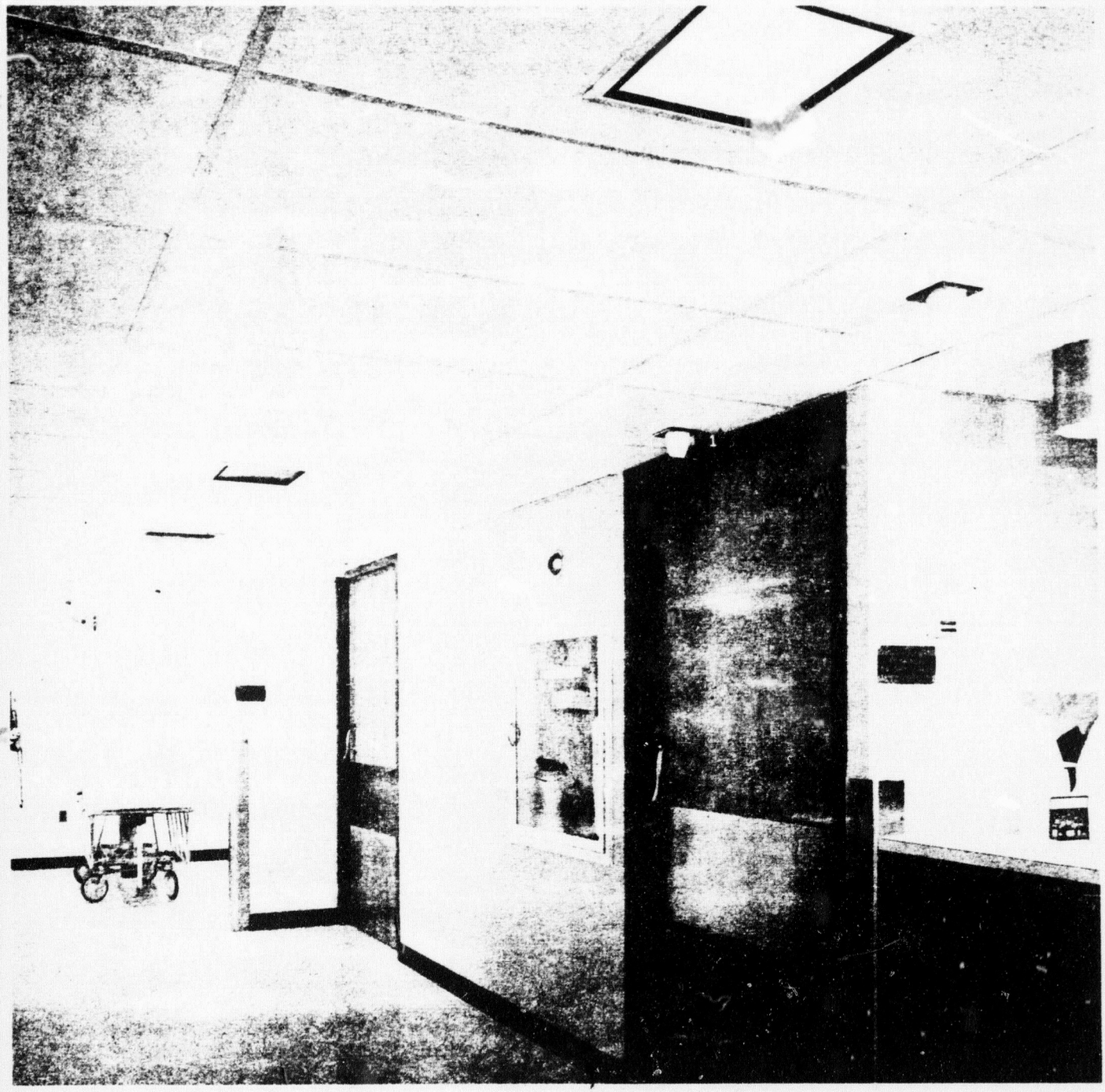
PIERCED

UNPERFORATED

Particle-Gard LPC® Firedike®

Low Particle Count Ceilings

The ideal ceiling for clean rooms and other environmentally controlled areas.



Johns-Manville

Description
J-M PARTICLE-GARD LPC FIREDIKE PANELS are the key components in a system which combines low particle fall-out, low static generation and good fire safety to make ideal ceilings for clean rooms and other environmentally controlled areas.

The faces of these non-breathing, felted mineral fiber panels are surfaced with an anti-dusting finish, then sealed with an anti-static clear plastic overspray. The edges are coated, annealed and relieved to virtually eliminate particle emission and the back of each panel is specially treated to minimize fall-out.

Particle-Gard LPC Firedike has good sound absorption and excellent sound attenuation properties, offers excellent washability and is available for several fire-rated constructions.

Recommended Uses
Particle-Gard LPC Firedike low particle count ceilings have many applications in manufacturing processes, research laboratories, assembly areas, etc., in the aerospace, electronic and precision manufacturing industries, as well as in medical facilities.

Many areas today have adopted the clean room concept and in these areas, stringent airborne particulate criteria are required.

The Particle-Gard system meets these criteria with the ideal combination of sound control, low particle count and fire resistance.

Surface Pattern
Particle-Gard LPC Firedike panels have a boldly stippled painted surface with small, pierced, random perforations.

Finishes
Particle-Gard panels have a Standard White vinyl paint finish with a low lustre acrylic clear plastic overspray.

Light Reflectance
75% or greater (ASTM C523-68)
LR-1 (Fed. Spec. SS-S-118A)

Flame Spread
Particle-Gard LPC Firedike panels are rated Class 25 under the Flame Spread Index of Federal Specification SS-S-118A. They have a flame spread rating of 0-25 according to ASTM E[illegible] Tunnel Test Method and carry [illegible] Fire Hazard Classification L[illegible]

Fire Endurance
These panels are eligible for use in fire-rated constructions of 2, 1½ and 1 hour ratings. They carry the U.L. Fire Resistance Label.

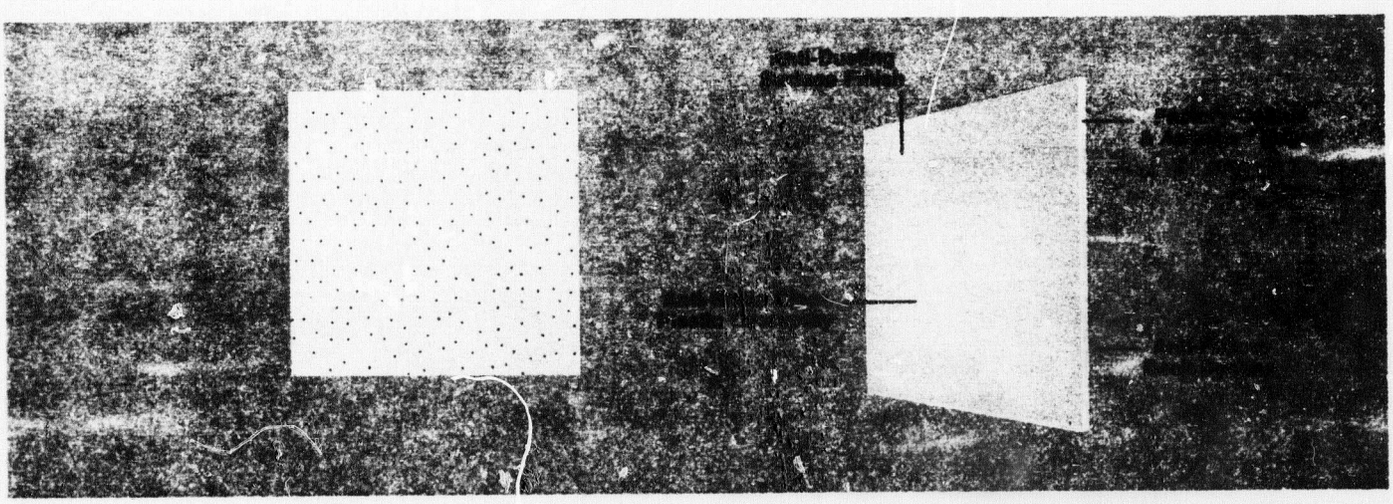
Environmental Specifications
Independent laboratory tests have established that Particle-Gard LPC Firedike ceilings, when properly installed, are within the limits of the following specifications and environmental classes for use in areas governed by these classes.

	Classes
Federal Standard 209B	
Clean Room	100
Work Station Requirements	10,000
Controlled Environment	100,000
George C. Marshall Space Center Standard MSFC-STD-246 Design and Operational Criteria of Controlled Environmental Areas	I and II
USAF Technical Order T.O.-.00-25-203 Standards and Guidelines for the Design and Operation of Clean Rooms.	

Installation
Particle-Gard LPC Firedike panels lay in on exposed grid suspension systems. A low density closed cell foam gasketing material must be used where minimal air leakage is required.

Sizes and Edge Details
(Nominal)
24" x 24" x 5/8" SE
24" x 48" x 5/8" SE

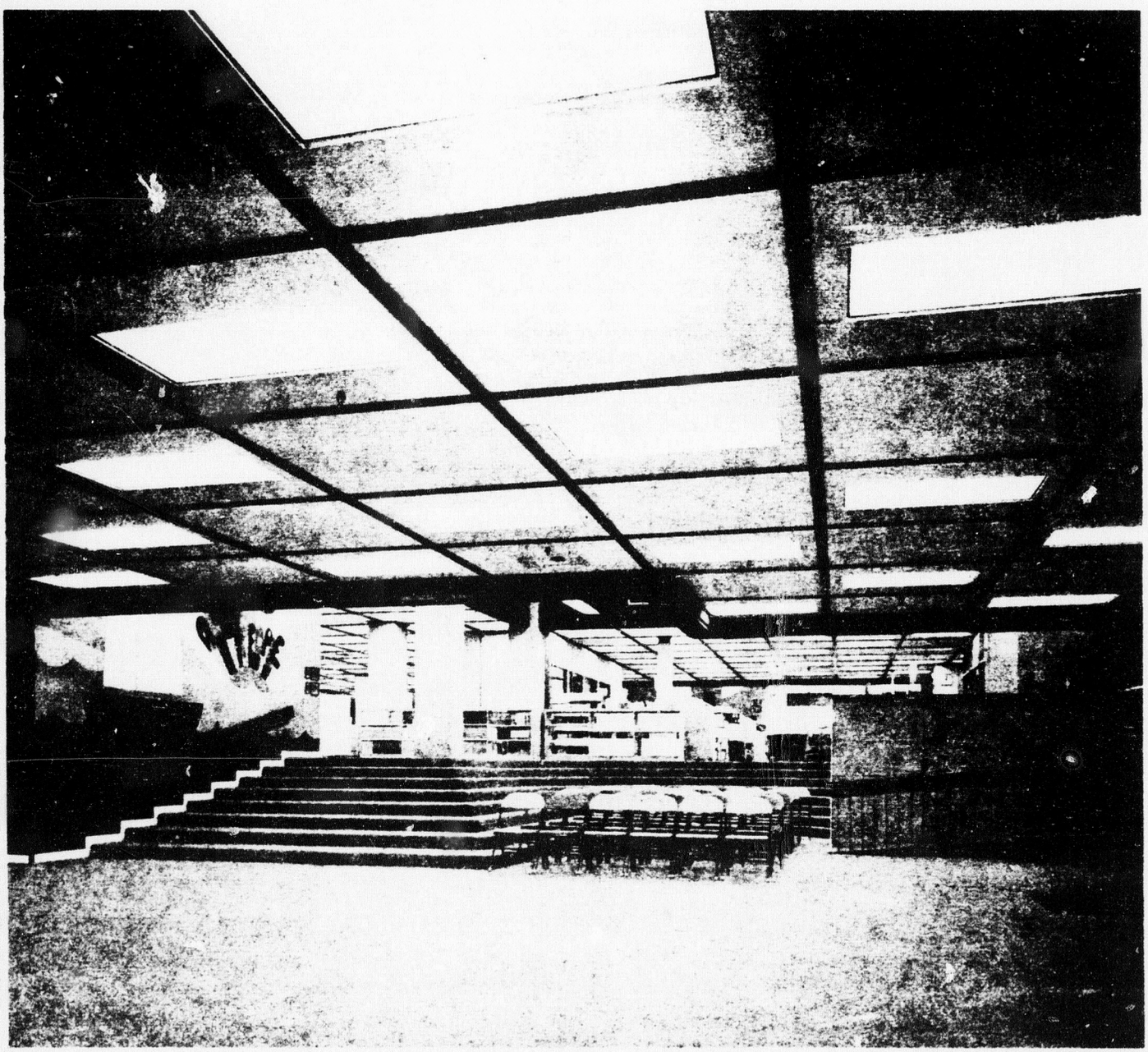
* This numerical flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.



SpanAcoustic®

Vinyl-Faced Fiber Glass Acoustical Panels

Combining exceptional sound control qualities, high thermal insulation values and washability in a lightweight, strong, dimensionally stable panel.



Johns-Manville

Description
J-M SPANACOUSTIC PANELS are lightweight panels made of flame-attenuated glass fibers, bonded with thermo-setting resins and faced with a rugged, textured vinyl film surface.

They are strong and dimensionally stable, resist buckling and warping. SpanAcoustic panels are light and flexible, bend without breaking or delaminating and snap back into shape, making them ideal for installation in cramped spaces. The vinyl surface can be easily cleaned by washing with normal detergents and water.

SpanAcoustic panels can be ordered in widths up to 5 feet, lengths to 10 feet, making installation fast and economical.

SpanAcoustic panels are available in three striking surface textures, and have extremely high acoustical efficiency, with NRC ranges up to .75-.85. Their excellent thermal insulation characteristics let these panels double as a highly significant part of the building insulation system.

SpanCore® panels are a lower cost version of SpanAcoustic panels, and are of similar construction. SpanCore panels are designed for use in installations where economical cost is an important factor and where a Class 25 U.L. label is not required.

Open-Plan SpanAcoustic is similar in construction and appearance to regular SpanAcoustic but is specially designed for use in open-plan interior space designs. See page 32 of this catalog for more information.

Recommended Uses
SpanAcoustic panels are particularly well suited for stores and shops, bowling alleys, supermarkets, post offices, factories, schools and other structures where their combination of exceptional sound-control qualities, high thermal insulation values and washability can be used to greatest advantage.

Surface Patterns
SpanAcoustic *Canyon* and *Vintage* and SpanCore *Pebble* are embossed with an "aggregate" or "pebbled" surface texture. *Canyon* has a more lightly embossed texture, while *Vintage* and *Pebble* are more deeply embossed.

SpanAcoustic *Matrix* has a striking, honeycomb pattern, embossed surface.

Finishes
SpanAcoustic and SpanCore panels have a white vinyl surface.

Light Reflectance
75% or greater (ASTM C523-68)
LR-1 (Fed. Spec. SS-S-118A).

Flame Spread
SpanAcoustic panels are rated Class 25 under the Flame Spread Index of Federal Specification SS-S-118A. SpanAcoustic panels have a flame spread rating of 0-25, according to ASTM E-84, Tunnel Test Method, and carry the U.L. Fire Hazard Classification Label.*

Installation
SpanAcoustic and SpanCore panels lay in on standard exposed grid suspension systems. Panels are flexible and can be bent to a considerable degree for ease of placement in cramped areas or those with difficult access. These panels allow complete accessibility to the plenum.

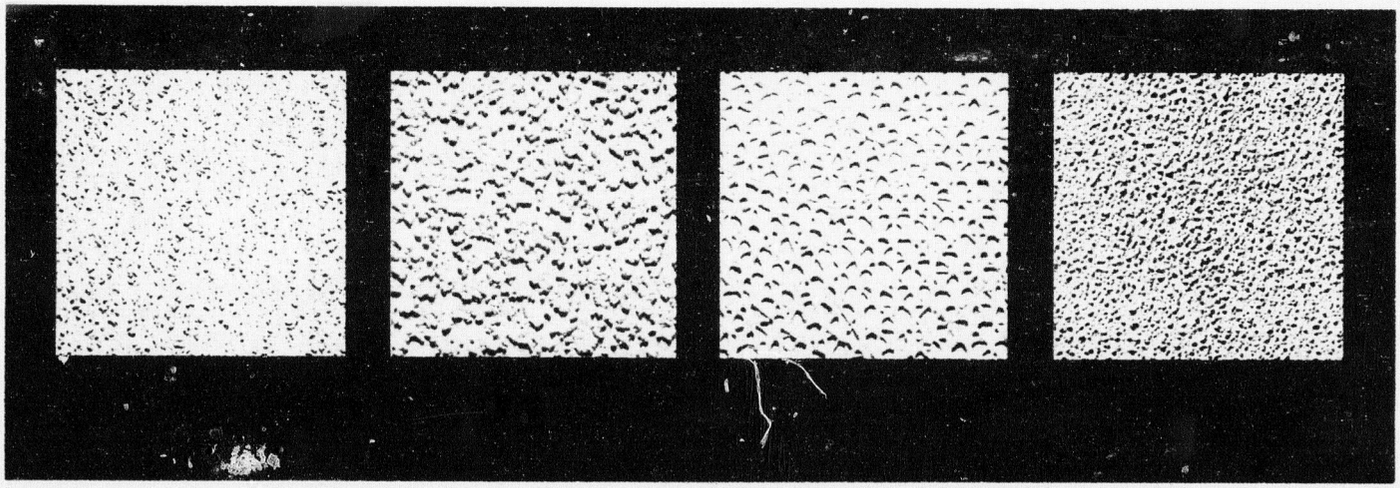
Thermal Insulation

	Thickness	R (Resistance
SpanAcoustic	1½"	R 6.12
SpanAcoustic	1"	R 4.08
SpanCore	1"	R 4.08
SpanCore	¾"	R 3.06

Sizes and Edge Details
SpanAcoustic and SpanCore panels are made in square edge only, in the following nominal sizes (other sizes are available on special order):

24" x 24" x 1" — Canyon, Vintage, Matrix, Pebble
24" x 48" x ¾" — Pebble
24" x 48" x 1" — Canyon, Vintage, Matrix, Pebble
24" x 48" x 1½" — Canyon, Vintage
48" x 48" x 1½" — Canyon, Vintage
60" x 60" x 1½" — Canyon, Vintage

* This numerical flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.



215 a

Firedike®

Mineral Fiber Tiles and Panels for Fire-Rated Ceiling Systems

Attractive sound control panels and tiles especially made for time-rated constructions.



Johns-Manville

Description
For personal safety and property protection, more building codes are calling for time-rated floor and ceiling constructions.

Johns-Manville Firedike ceiling tiles and panels provide an economical and efficient means of providing fire-rated protection to ceiling structures. They go in quickly and cleanly, need no drying or curing time.

J-M Firedike tiles and panels are specially made for use in time-rated constructions while also giving all of the other benefits of modern acoustical ceilings including outstanding appearance.

Firedike tile is tested and listed by Underwriters' Laboratories, Inc. for use in 3, 2, 1½ and 1 hour fire-retardant floor and ceiling systems. Firedike panels are listed for 2, 1½ and 1 hour fire-retardant roof or floor and ceiling assemblies.

J-M felted mineral fiber tiles and panels, and aluminum-clad felted mineral fiber tiles are available as Firedike. See "Patterns and Sizes" for specific products and patterns.

Recommended Uses
The large variety of pattern and sizes, fire resistance, cleanability and good acoustical properties make Firedike tiles and panels suitable for a wide range of applications in modern structures such as schools, office buildings, mall areas and retail shops and stores. Excellent (up to 40-44) sound attenuation values minimize transfer of sound from room to room through the plenum and make them particularly suitable for use in high-rise office buildings with movable ceiling-high partition systems.

Patterns
Firedike tiles and panels are made in a variety of patterns as illustrated here. The patterns are identical in appearance to those of other J-M acoustical products bearing the same pattern names.

Finishes
Firedike tile and panels have a Standard White vinyl paint finish. An additional acrylic CPO (Clear Plastic Overspray) finish is optional.

Acousti-Clad Firedike tiles have a baked, high-molecular weight, resin coating in white, silver, gold or copper colors.

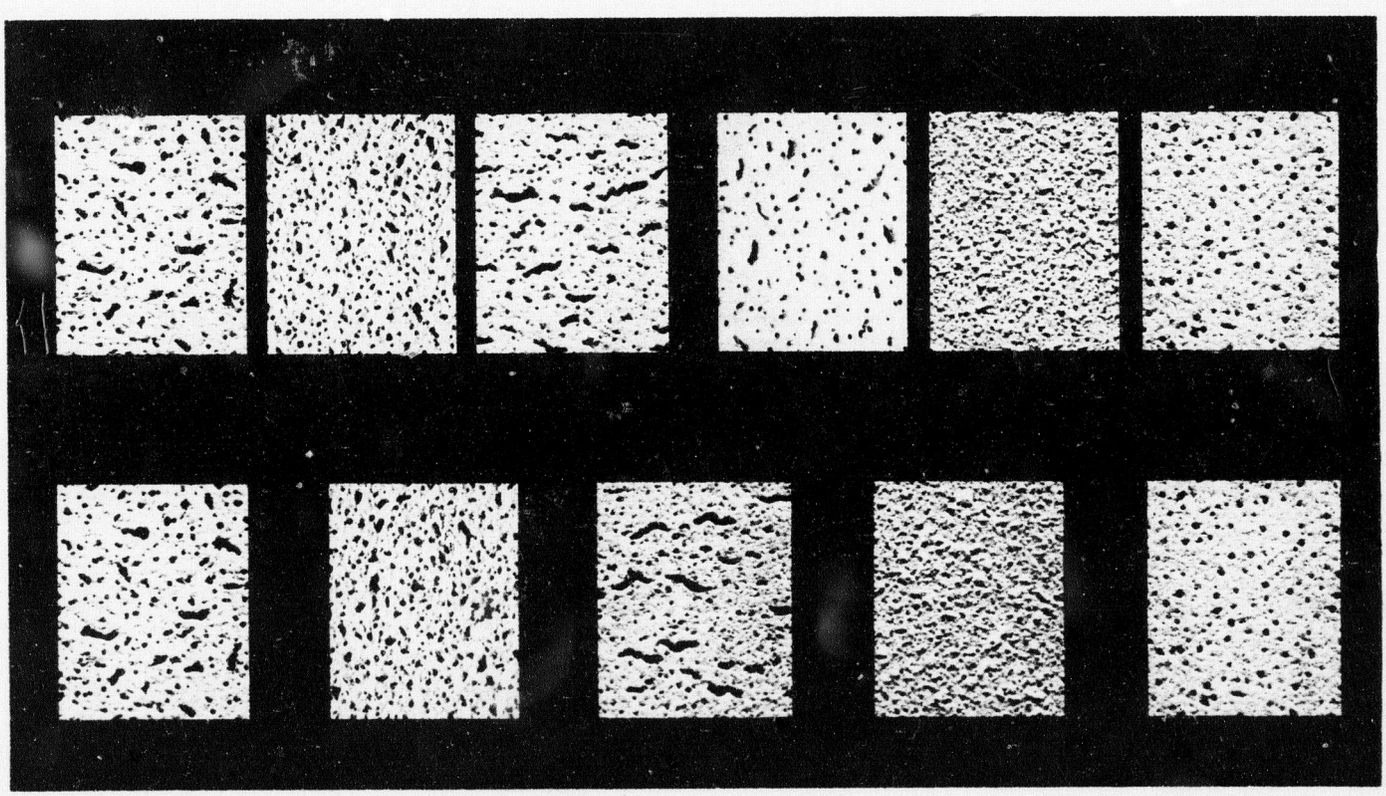
Light Reflectance
75% or greater (ASTM C523-68). LR-1 (Fed. Spec. SS-S-118A). Acousti-Clad tiles are LR-2, 70-74%.

Flame Spread
Firedike tile and panels are rated Class 25 under the Flame Spread Index of Federal Specification SS-S-118A. They have a flame spread rating of 0-25 according to ASTM E-84, Tunnel Test Method and carry the U.L. Fire Hazard Classification Label.*

Fire Endurance
Firedike tile and panels have been tested and rated under ASTM E-119 and carry the U.L. Fire Resistance Classification Label.

Installation
Firedike tile and panels are installed with concealed and exposed fire rated grid suspension systems. See the following pages for time-rated constructions.

*This numerical flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.



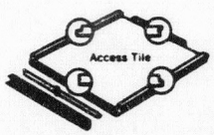
Firedike (CONTINUED) *Technical Data*

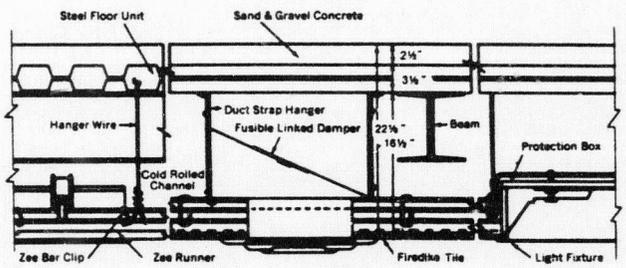
PATTERN	SIZE (NOMINAL)	RATING	EDGE DETAIL
TEMPER-TONE TILES			
Firedike 360	12″ x 12″ x ¾″	3,2,1½,1 hr.	BE TGK, SE TGK
Firedike 360	12″ x 12″ x ¾″	2,1½,1 hr.	BE KCB-4
Firedike 360	12″ x 24″ x ¾″	2 hr.	BE KCB-4
Firedike 360	12″ x 12″ x ⅝″	2,1½ hr.	BE TGK, SE TGK BE KCB-4
Firedike DCF	12″ x 12″ x ¾″	2,1½,1 hr.	BE KCB-4
TENU-TONE TILES			
Firedike Omni	12″ x 12″ x ⅝″	2,1½ hr.	BE KCB-4
QUADRETTE			
Firedike	24″ x 24″ x ⅝″	1½ hr.	Reveal Edge
Firedike	24″ x 24″ x ¾″	2 hr.	Reveal Edge
ACOUSTI-CLAD TILES			
Firedike — Random, Diagonal, Delta	12″ x 12″ x ⅝″	2,1½ hr.	KCB-4
FIREDIKE PANELS ⅝″ AND ¾″			
Firedike 360, DCF, 720 Pierced, Concord, Concord Unperforated	2′ x 2′ 2′ x 3′ 2′ x 4′	2,1½,1 hr.	SE

Tile and Panel Installation

3-hour Time-Design No. A007 (54-3)
Restrained Assembly Rating — 3 hr.
Unrestrained Assembly Rating — 3 hr.
Unrestrained Beam Rating — 3 hr.

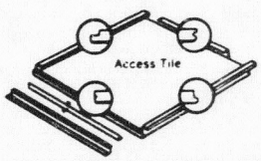
12" x 12" x ¾" T & G tile. Up to 25 sq. ft. protected recessed light fixtures and up to 576 sq. in. air duct openings per 100 sq. ft. of ceiling.

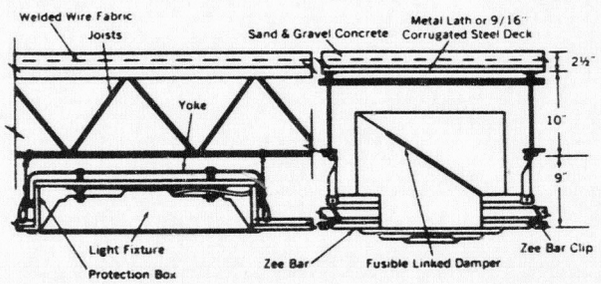




2-hour Time-Design No. G015 (60-2)
Restrained Assembly Rating — 2 hr.
Unrestrained Assembly Rating — 2 hr.

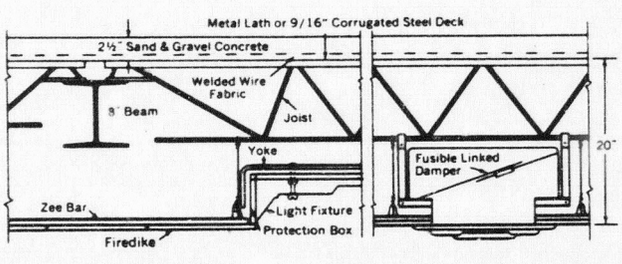
12" x 12" x ⅝" or ¾" T & G tile. Up to 25 sq. ft. protected recessed lighting fixtures and up to 576 sq. in. air duct openings per 100 sq. ft. of ceiling.





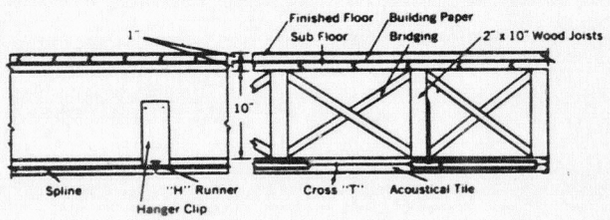
2-hour Time-Design No. G014 (247-2)
Restrained Assembly Rating — 2 hr.
Unrestrained Assembly Rating — 2 hr.
Unrestrained Beam Rating — 3 hr.

12" x 12" x ⅝" or ¾" T & G ventilating or non-ventilating, KCB-4 non-ventilating and Acousti-Clad Firedike. Max. 16 sq. ft. protected recessed lighting fixtures and 576 sq. in. of air duct openings per 100 sq. ft. of ceiling.



1-hour Time-Design No. L002 (20-1)
Unrestrained Assembly Rating — 1 hr.

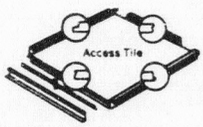
12" x 12" x ¾" KCB-4 tile.

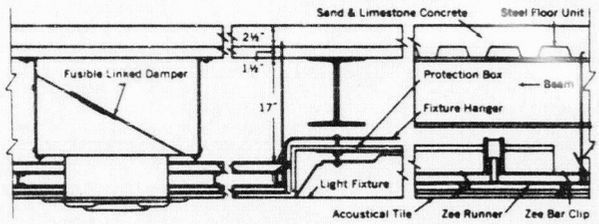


Firedike (CONTINUED) *Tile and Panel Installation*

2-hour Time-Design No. D001 (70-2)
Restrained Assembly Rating — 2 hr.
Unrestrained Assembly Rating — 2 hr.
Unrestrained Beam Rating — 3 hr.

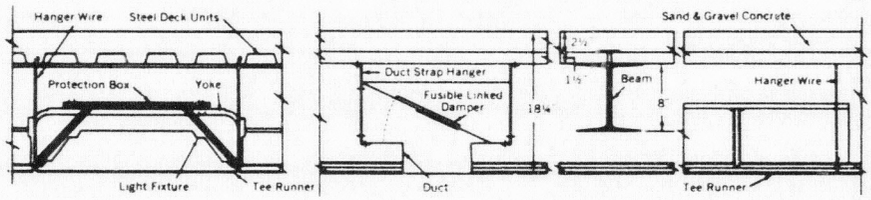
12" x 12" x 5/8" or 3/4" T & G tile. Up to 25 sq. ft. protected recessed lighting fixtures and up to 576 sq. in. air duct openings per 100 sq. ft. of ceiling.





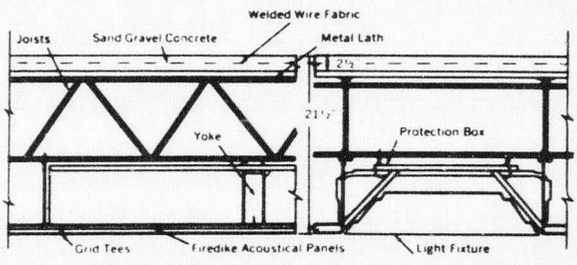
2-hour Time-Design No. D204 (71-2)
Restrained Assembly Rating — 2 hr.
Unrestrained Assembly Rating — 2 hr.
Unrestrained Beam Rating — 2 hr.

23¾" x 23¾" or 23¾" x 47¾" x 5/8" or 3/4" panels. Up to 24 sq. ft. protected recessed lighting fixtures per 100 sq. ft. of ceiling with 23¾" x 47¾" panels and up to 20 sq. ft. protected lighting fixtures per 100 sq. ft. of ceiling with 23¾" x 23¾" panels. Up to 576 sq. in. air duct openings.



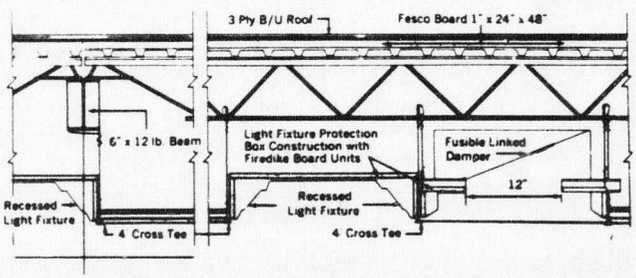
2-hour Time-Design No. G225 (76-2)
Restrained Assembly Rating — 2 hr.
Unrestrained Assembly Rating — 2 hr.

23¾" x 47¾" x 5/8" or 3/4" panels. Up to 20 sq. ft. protected recessed lighting fixtures and 60 sq. in. air duct openings per 100 sq. ft. of ceiling.



1-hour Time Design No. P208 (RC-11-1)
Restrained Assembly Rating — 1 hr.
Unrestrained Assembly Rating — 1 hr.
Unrestrained Beam Rating — 1 hr.

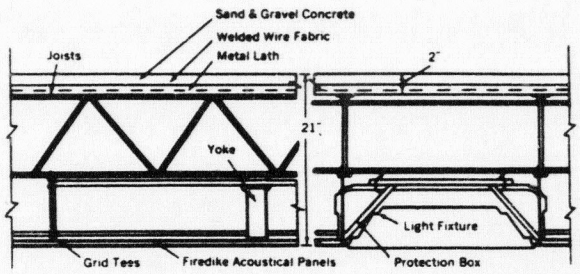
23¾" x 47¾" x 5/8" panels under insulated steel roof deck. Up to 16 sq. ft. protected recessed lighting fixtures per 100 sq. ft. and up to 57 sq. in. air duct openings per 100 sq. ft. of ceiling.



Johns-Manville

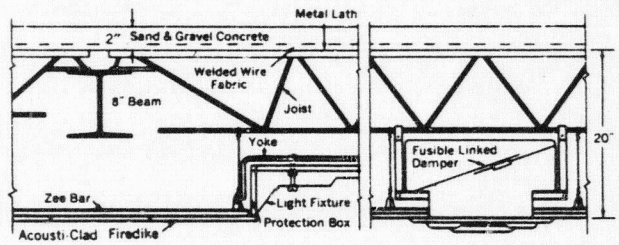
1½-hour Time-Design No. G226 (25-1½)
Restrained Assembly Rating — 1½ hr.
Unrestrained Assembly Rating — 1½ hr.

23¾" x 23¾" x ⅝" panels. Up to 8 sq. ft. protected recessed lighting fixtures per 100 sq. ft. of ceiling.



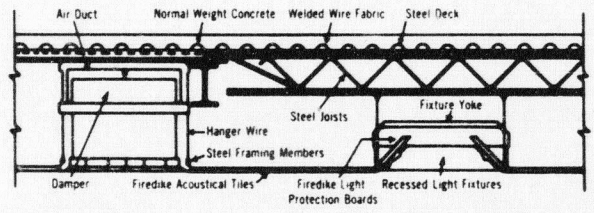
1½-hour Time-Design No. G016 (23-1½)
Restrained Assembly Rating — 1½ hr.
Unrestrained Assembly Rating — 1½ hr.
Unrestrained Beam Rating — 2 hr.

12" x 12" x ⅝" or ¾" T & G ventilating or non-ventilating and KCB-4 non-ventilating and Acousti-Clad Firedike with up to 16 sq. ft. protected recessed lighting fixtures per 100 sq. ft. of ceiling and up to 113 sq. in. air duct openings.



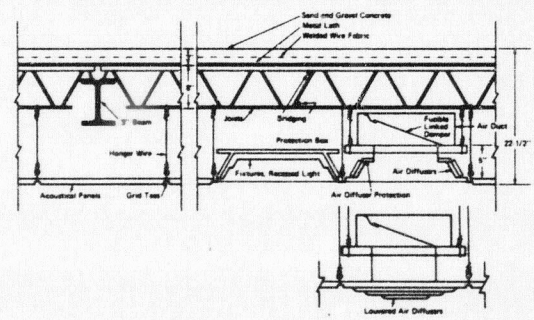
2-hour Time-Design No. G035
Restrained Assembly Rating — 2 hr.
Unrestrained Assembly Rating — 2 hr.
Unrestrained Beam Rating — 3 hr.

12" x 24" x ¾" and 12" x 12" x ¾" KCB Firedike tiles with up to 24 sq. ft. protected recessed lighting fixtures per 100 sq. ft. of ceiling and up to 288 sq. in. air duct openings per 100 sq. ft. of ceiling.



2-hour Time-Design No. G246
Restrained Assembly Rating — 2 hr.
Unrestrained Assembly Rating — 2 hr.
Unrestrained Beam Rating — 2 hr.

23¾" x 23¾" x ¾" reveal edge lay-in panels with up to 24 sq. ft. per each 100 sq. ft. of ceiling area protected recessed lighting fixtures and up to 576 sq. in. air duct openings per 100 sq. ft. of ceiling.



Open-Plan™ SpanAcoustic

Vinyl-Faced Fiber Glass Acoustical Panels

Combines a rich, attractive appearance with extremely high noise reduction qualities.



Description

J-M OPEN-PLAN SPANACOUSTIC PANELS are fiber glass panels combined with a surface of perforated vinyl.

They are similar to J-M SpanAcoustic panels in their strength, stability, flexibility and cleanability. However, they offer even higher acoustical efficiency, with Noise Reduction Coefficients (NRC) of .85-.95.

Open-Plan SpanAcoustic panels are available in custom sizes to fit any module.

Recommended Uses

Open-Plan SpanAcoustic panels are excellent for office buildings, schools, meeting rooms and other applications where a quiet environment will add to the comfort and efficiency of the occupants. They are especially designed to offer voice privacy in open-plan interior space designs.

Surface Patterns

Open-Plan SpanAcoustic panels come in *Canyon* pattern with a white, lightly embossed and perforated face.

Finishes

Open-Plan SpanAcoustic panels are available with a white vinyl surface.

Light Reflectance

75% or greater (ASTM C523-68)
LR-1 (Fed. Spec. SS-S-118A)

Flame Spread

Open-Plan SpanAcoustic panels are rated Class 25 under the Flame Spread Index of Federal Specification SS-S-118A. The panels have a flame spread rating of 0-25, according to ASTM E-84, Tunnel Test Method, and carry the U.L. Fire Hazard Classification Label.*

Installation

Open-Plan SpanAcoustic panels lay in on standard exposed grid suspension systems. Panels are flexible for ease of placement and access to the plenum area.

Thermal Insulation

Thickness	R (Resistance)
1½"	R 6.12

Sizes and Edge Details

Square edge only in the following nominal sizes:

24" x 24" x 1½"
24" x 48" x 1½"
48" x 48" x 1½"
60" x 60" x 1½"

(Other custom sizes available on special order.)

*This numerical flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.

Johns-Manville

SPECIAL OPTION

Access Ceilings

For Concealed Suspension Systems



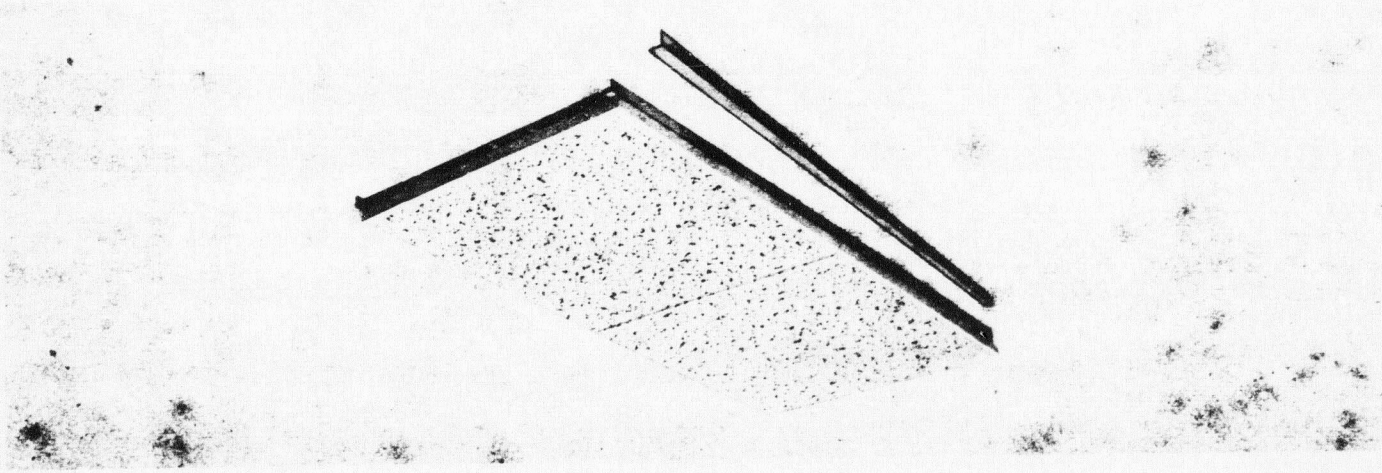
Access into the plenum area of concealed suspension system ceilings for the repair, adjustment or relocation of partitions, lighting fixtures, air distribution equipment, electric wiring, communications equipment, or plumbing is readily and economically accomplished using a concealed suspension system and J-M's non-directional fissured, dimensionally-stable Temper-Tone 360 Access Tile.

These tiles are visually identical to standard Temper-Tone 360 tiles, but they have a special edge design permitting upward access without the need for special tools.

Tiles can be completely removed, rearranged or damaged tiles replaced with a minimum of effort by building maintenance personnel, without materially disrupting normal room activity.

Temper-Tone 360 Access Tiles are particularly suited for concealed system installations in which a common plenum covers two or more rooms over ceiling-high demountable partitions. High sound attenuation values (STC 45-49) minimize the transmission of annoying sounds between rooms through the plenum and Temper-Tone 360 also provides very good absorption in the .60-.70 NRC range.

A wide selection of other J-M ceiling products may be used for access in concealed, semi-concealed, or exposed grid suspension systems with only slight modification and/or special fabrications.



SPECIAL OPTION

Ventilating Ceilings

For Distribution of Conditioned Air

Description

J-M VENTILATING CEILING TILES provide an efficient yet inexpensive way to distribute conditioned air to any size room.

The plenum space no longer serves just to house air conditioning ducts but becomes a true air plenum, sealed around the edges and insulated against heat loss or gain.

Air is introduced to the plenum space through supply duct stubs and then flows gently and uniformly from the plenum to the room below through a sound control ceiling with a scientifically-determined number of perforations. By arrangement of ventilating and non-ventilating acoustical units and careful placement of supply stubs, conditioned air is delivered exactly as required.

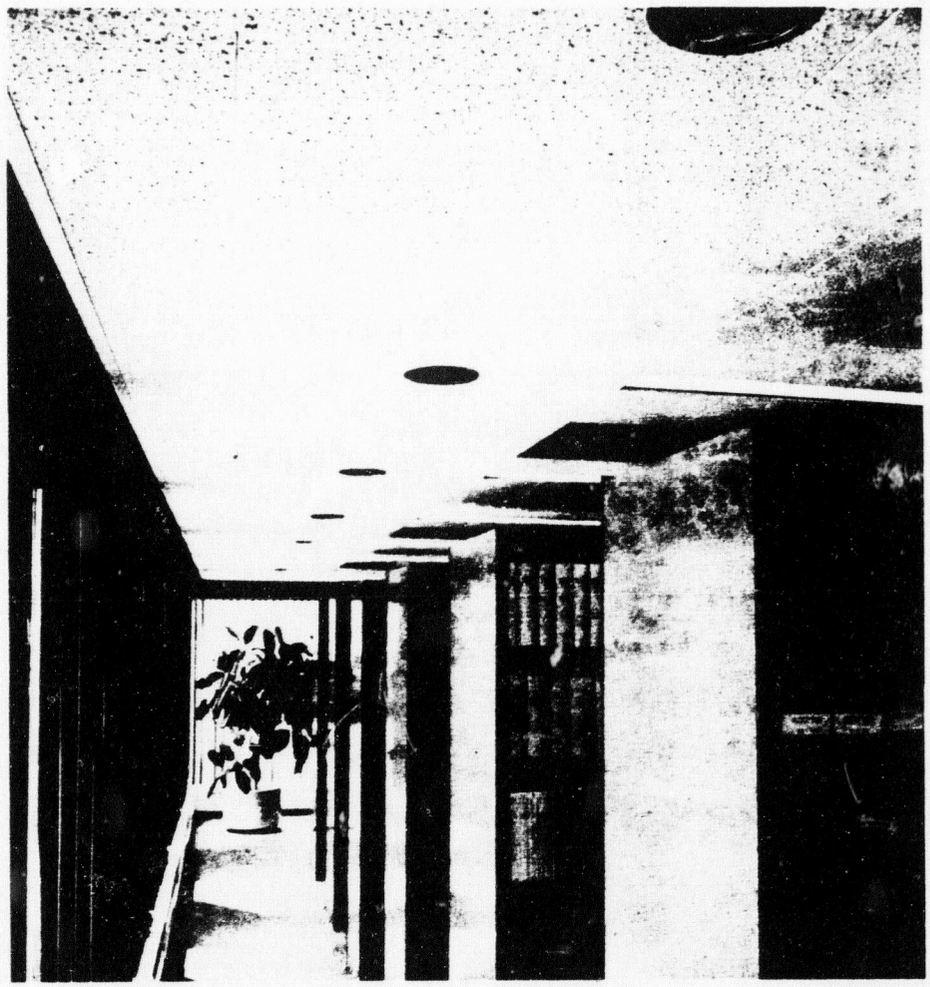
The J-M mineral fiber tiles which are made for this purpose have small through-perforations as part of their surface patterns. They are compatible visually, and in their other characteristics, to their non-ventilating counterparts. Thus J-M Ventilating Ceilings can perform a number of functions simultaneously — such as distribution of conditioned air, sound absorption, aesthetics, and fire safety.

Since no supply diffusers or registers are required, the architect has more freedom in design and can create a cleaner looking, less cluttered ceiling area.

Patterns Available

J-M Ventilating Ceilings are available in the following sizes and patterns (others available on special order):

Temper-Tone 360 Tile 12″ x 12″ x ¾″ BE KCB-4



Acousti-Clad Perlite Core Random 12″ x 12″ x ⅞″ BE KCB-4

Acousti-Clad Firedike Random 12″ x 12″ x ⅝″ BE KCB-4

Installation

J-M Ventilating Ceilings are installed in the same manner as their conventional counterparts on a concealed suspension system. The only additional step is the sealing and insulation of the plenum area to prevent pressure and heat loss.

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Installation Recommendations

Storage
Prior to installation, acoustical material should be stored in an area protected from possible damage and in a manner that allows identification as well as removal of any damaged material.

Installation
Conditions of storage and installation should approximate those expected during occupancy. HVAC systems should be installed and operating under occupancy conditions. These should not exceed 60-85°F and a maximum of 80% relative humidity.

Concrete, terrazzo or plaster work should be complete and dry. Windows and doors should be in place and glazed. Duct work and above-ceiling conduit should be in place. Roof and floor decks should be thoroughly dry or cured. Plenums should be vented where required.

Cement Application
Surface must be clean and dry and free of coating material likely to interfere with bond. Concrete, plaster or gypsum surfaces should not be subject to condensation. Temperatures should not exceed the range of 60-85°F. Adhesive materials designed by the manufacturer for the particular installation conditions should be used. The adhesive should comply with the general requirements of Interim Federal Specification MMM-A-00150a or ASTM D1779.

Generally, adhesive performance is not guaranteed by the adhesive manufacturer when high humidity conditions prevail in the installation.

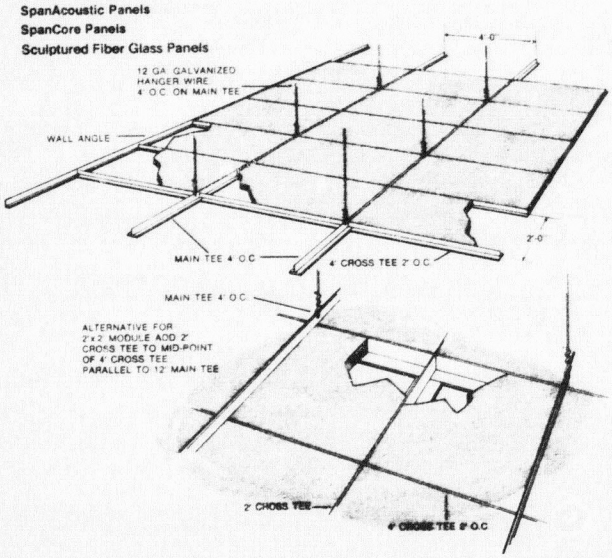
Lighting
Careful attention to lighting and ingenuity in light placement can create striking effects on ceilings, particularly when using sculptured or heavily textured acoustical elements. However, light can also affect ceiling appearance in a detrimental way, especially when a monolithic appearance is desired.

Where light from fixtures, cove lights or high windows strikes the surface at a small angle, even slight unevenness of joints may result in unsatisfactory appearance. Under such conditions beveled edge materials should be used in preference to square edge materials and installed with considerable care.

When a ceiling installation is appraised for appearance, lighting, drapes or shades, etc., should be as used for normal occupancy.

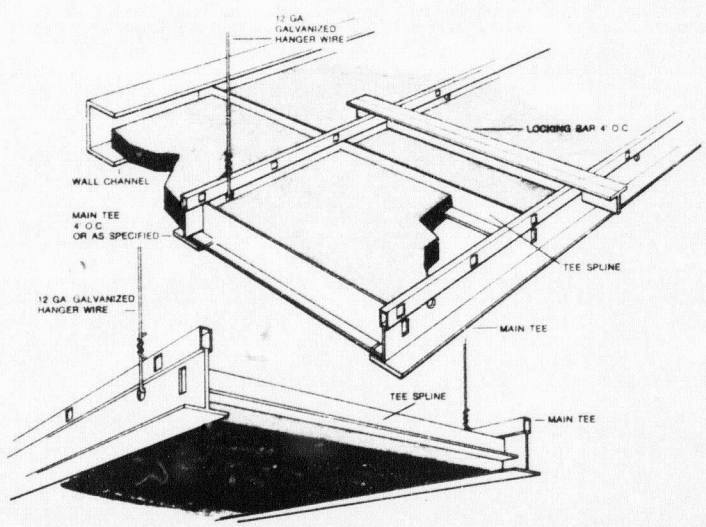
Exposed Grid Suspension System

Spintone Panels
Firedike Panels
Quadrette Panels
SpanAcoustic Panels
SpanCore Panels
Sculptured Fiber Glass Panels



Semi-Concealed Suspension System

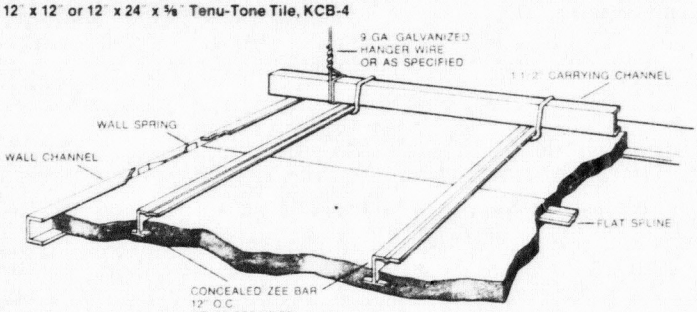
12" x 23¾" to 47¾" x ¾" Temper-Tone Tile, BE KCB-2, Long Edges
12" x 23¾" to 24" x 59¾" x ⅝" Tenu-Tone Tile, BE KCB-2, Long Edges

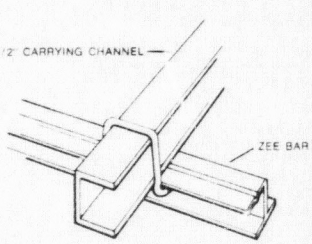


Installation Recommendations

Concealed Zee Bar Suspension System

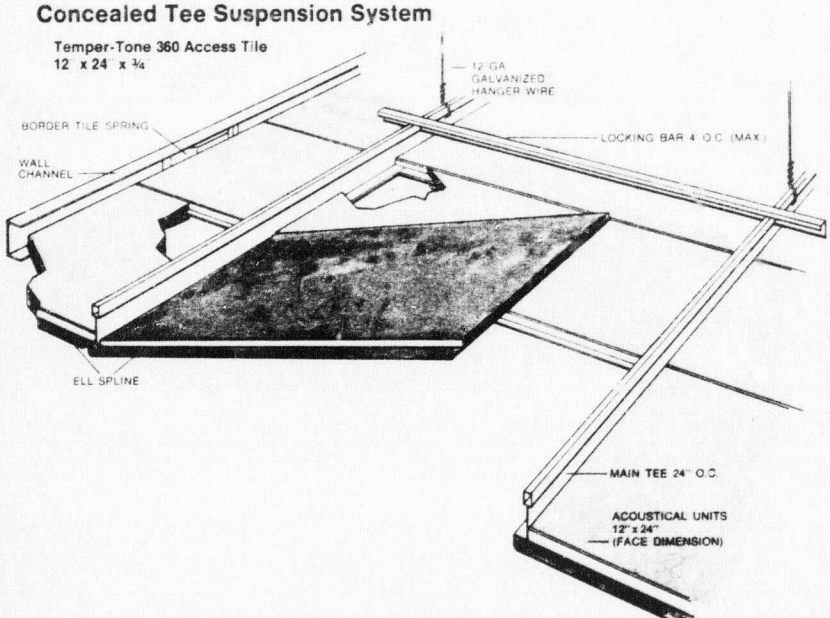
12" x 12" x 5/8" or 7/8" Acousti-Clad Tile, KCB-4
12" x 12" or 12" x 24" x 3/4" Temper-Tone Tile, KCB-4
12" x 12" or 12" x 24" x 5/8" Tenu-Tone Tile, KCB-4

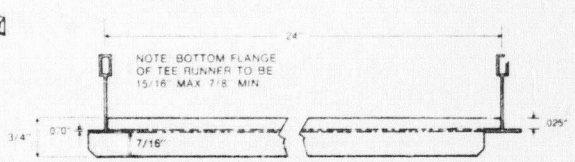




Concealed Tee Suspension System

Temper-Tone 360 Access Tile
12" x 24" x 3/4

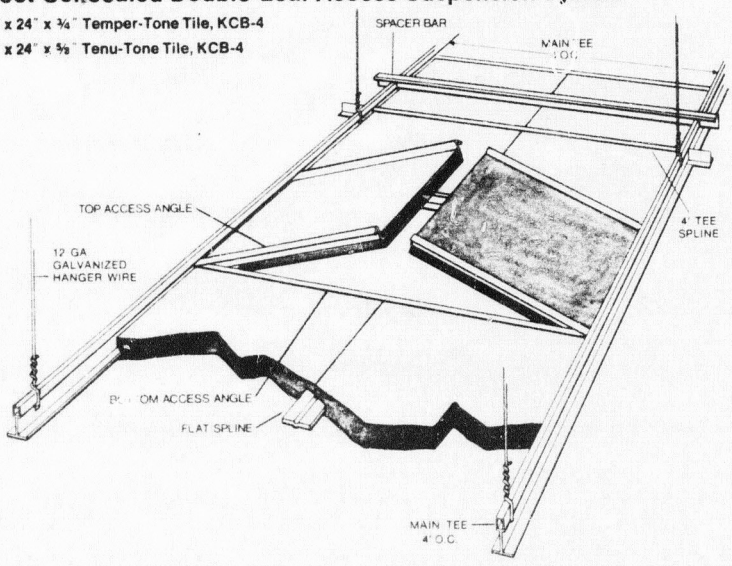


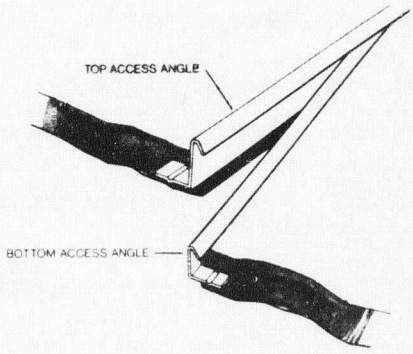


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Direct Concealed Double-Leaf Access Suspension System

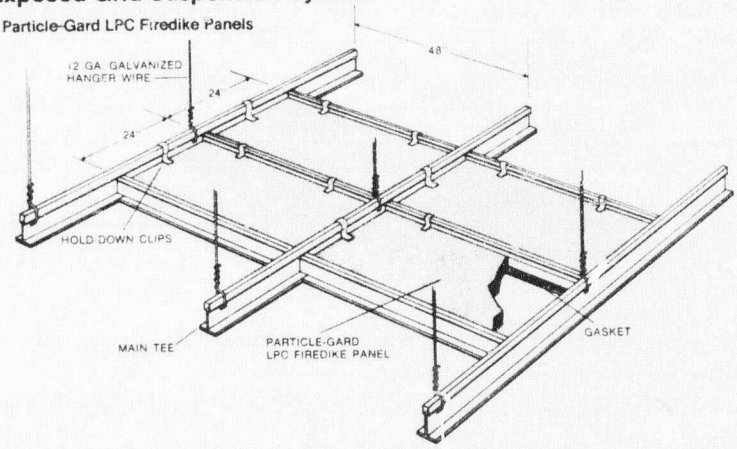
12" x 24" x ¾" Temper-Tone Tile, KCB-4
12" x 24" x ⅝" Tenu-Tone Tile, KCB-4

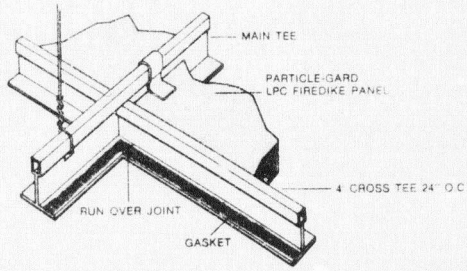




Exposed Grid Suspension System

Particle-Gard LPC Firedike Panels





Thermal—Acoustical Batts

Fiber Glass Thermal-Acoustical Insulation

Description
J-M THERMAL-ACOUSTICAL FIBER GLASS BATTS aid in answering two demands in modern structures, the control of sound and the control of heat transmission to insure thermal comfort and quieter surroundings through lower sound transmission.

These fiber glass batts, made especially for their combined role, owe much of their efficiency to fine, uniformly textured, flame-attenuated glass fibers; light, strong and highly resilient.

The same qualities that make them efficient thermal insulations make them excellent absorbers of the noise from air conditioning and ventilating units. The transmission of sound from room to room is greatly reduced when these batts are placed over ceiling tiles or panels.

Recommended uses
J-M Thermal-Acoustical Batts are made specifically for use with suspended ceiling systems. Installed above the ceiling panels or tiles, they provide thermal control where it is needed most.

Flame Spread
Acoustical Batts, when installed without vapor barrier, have a flame spread rating of 0-25 when tested in accordance with ASTM E-84, Tunnel Test Method and carry the U.L. Fire Hazard Classification Label.*

Sound Absorption
J-M Thermal-Acoustical Batts are used to reinforce the acoustical values provided by suspended ceiling systems. The sound absorption chart on this page shows the increase in NRC when 4" batts are used over 1½" thick SpanAcoustic® panels.

Installation
Batts simply lay in place over the ceiling panels — an easy and speedy operation. Because of their light weight, they are easily moved and do not interfere with access to the plenum.



Sizes and Types
J-M Thermal-Acoustical Batts
(Nominal sizes)
24" x 48" x 4" with or without vapor barrier
24" x 48" x 6½" with or without vapor barrier

Thermal Resistance "R"
Thermal-Acoustical Batts

Thickness	"R" Insulation Only
4" Batt	11
6½" Batt	19

Sound Absorption Coefficients
This table illustrates a typical example of the improvement in sound absorption with J-M Thermal-Acoustical Fiber Glass Batts.

	SpanAcoustic Thickness 1½"	SpanAcoustic (plus Full-Thik Batts) Thickness 5½"
Mounting	7	7
Coefficients		
125 Hz	.86	.97
250 Hz	.91	1.00
500 Hz	.80	1.00
1000 Hz	.89	.88
2000 Hz	.62	.65
4000 Hz	.47	.40
NRC	.80	.90

* This numerical flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.

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Sound Control Blankets

Fiber Glass Acoustical Insulation

Description

J-M SOUND CONTROL BLANKETS are made specifically to aid in the control of sound transmission from room to room through common partitions.

These fiber glass blankets are made from fine, uniformly textured, flame attenuated glass fibers. They are light, strong and highly resilient. They come in roll form and are perforated at four-foot intervals to be easily and quickly snapped apart into desired lengths.

A wall with J-M Sound Control Blankets will have a sound transmission class approximately equal to identical constructions using mineral wool or other heavier batts.

Recommended Uses

The principal function of J-M Sound Control Blankets is room-to-room acoustical insulation although they have excellent thermal insulation properties. They are made and sized especially for a friction fit in standard steel stud partitions. Typical usage is illustrated on this page.

Flame Spread

These blankets have a flame spread rating of 0-25 when tested in accordance with ASTM E-84, Tunnel Test Method and carry the U.L. Fire Hazard Classification Label.*

Sound Transmission

Fiber glass Sound Control Blanket improve the sound transmission class of typical steel stud, gypsum-faced walls an average of four to nine STC units over uninsulated walls.

Sizes and Types

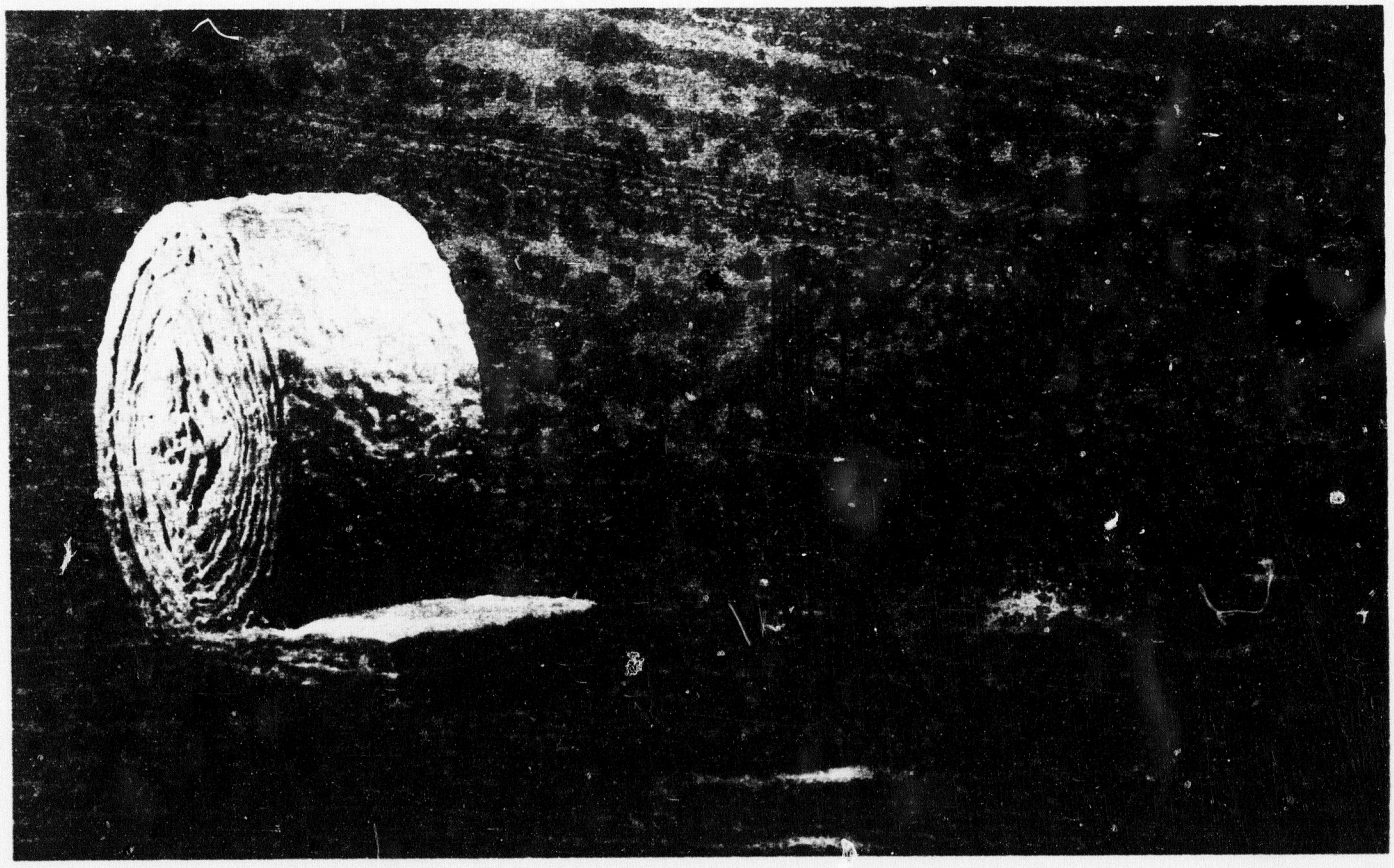
J-M Sound Control Blankets are available unfaced only. Sizes available are:

Widths: 16" and 24"

Thicknesses: 2¾" (for 2½" studs)
4" (for 3⅝" studs)

Length: Rolls perforated at 48" intervals.

* This numerical flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.



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Materials, Finishes, Coatings

Materials and Finishes

Johns-Manville ceiling tile and panels are of three basic constructions:

Felted Mineral Fiber
J-M felted mineral fiber tiles and panels are made of a composition of substantially inorganic fibers tightly bonded together by a wet felting process. The resultant tile and panel base is rigid and durable and, when suitably finished with a decorative coating and fissured and/or perforated, functions as an attractive acoustical material.

Metal Faced
J-M Acousti-Clad tiles are made with three specially-formulated core materials. The facing is of aluminum, finished with a durable, baked-on, high molecular weight polymer coating. J-M Duratone panels combine a felted mineral fiber composition core with a vinyl surfaced, fiber glass reinforced, aluminum facing which imparts easy cleaning and abuse resistance.

Fiber Glass
J-M fiber glass products are composed of long, fine, glass fibers made by a unique, flame attenuation process. These fibers are bonded together by thermo-setting resins. J-M SpanAcoustic and SpanCore panels are faced with a textured, non-breathing vinyl film. Sculptured fiber glass panels are three-dimensional with the fiber glass compressed and molded under heat and pressure. The textured finish is a white vinyl paint.

Finishes
All J-M felted mineral and sculptured fiber glass tiles and panels have a white vinyl paint finish. An optional acrylic CPO (Clear Plastic Overspray) finish is available on J-M Temper-Tone, Tenu-Tone, Spintone, Firedike and Quadrette tile and panels.

J-M SpanAcoustic, Open-Plan SpanAcoustic and SpanCore panels come with an embossed, rigid-type vinyl film facing.

Acousti-Clad tile has an aluminum facing with a baked-on, high molecular weight, polymer coating. Duratone panels have a vinyl-surfaced, fiber glass reinforced aluminum facing.



Johns-Manville

Maintenance

Maintenance and Cleaning

Most J-M acoustical products are made with a white vinyl paint finish. They may be cleaned of dust and loose soil by vacuuming with a soft brush. An art gum eraser can be used on marks and smudges. The surface may be cleaned with a sponge or cloth dampened with a mild detergent or soap solution and then rinsed with a sponge dampened with clean water.

Felted mineral tiles and panels can be repainted using spray, brush or roller and normal painting procedures. This will not affect the acoustical qualities of the ceiling system to any appreciable degree. A high quality interior flat paint is recommended for easy maintenance and to avoid frequent repainting. Caution should be taken to clean the surface thoroughly before repainting and to avoid applying paint thick enough to bridge the smaller perforations in the acoustical units.

For extra resistance to soiling and superior washability, a factory-applied acrylic CPO (Clear Plastic Overspray) is available on most felted mineral tiles and panels. *CPO is subject to staining in the presence of iodine compounds.*

The vinyl surface of SpanAcoustic, Open-Plan SpanAcoustic and SpanCore panels is easily cleaned with ordinary detergents and water.

When frequent cleaning and maintenance are required, Acousti-Clad tiles or Duratone panels are recommended. They are easily cleaned with most detergent solutions and withstand repeated scrubbings.



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Technical Data

Product Descriptions

PAGE	PRODUCT	DESCRIPTION
8-9	Temper-Tone® Tile	Felted mineral fiber tiles with directional or non-directional fissured patterns.
10-11	Tenu-Tone® Tile	Felted mineral fiber tiles, fissured, pierced, random and uniform punched patterns.
12-13	Acousti-Clad® Tile	Aluminum-clad tile with a choice of perlite core, felted mineral fiber core, or time-rated felted mineral fiber core.
14-15	Sculptured Fiber Glass Panels: Prismatic® Profile® Acousti-Shell®	3-dimensional, sculptured fiber glass lay-in panels.
16-17	Quadrette® Panels	Felted mineral fiber lay-in units with non-directional fissured pattern. Reveal edges allow panel to extend below grid plane.
18-19	Spintone® Panels	Felted mineral fiber lay-in panels in combinations of fissured, pierced and textured patterns.
20-21	Duratone™ Panels	Felted mineral fiber lay-in panels with a vinyl surfaced, fiber glass reinforced aluminum facing.
22-23	Particle-Gard LPC® Firedike® Panels	Felted mineral fiber lay-in panels rated for Class 100 Clean Rooms.
24-25	SpanAcoustic® Panels SpanCore® Panels	Embossed vinyl-faced fiber glass lay-in panels.
26-31	Firedike Tile and Panels	Time-rated mineral fiber units.
32	Open-Plan SpanAcoustic® Panels	Embossed and perforated vinyl-faced fiber glass lay-in panels for use in open-plan interior designs.
33	Access Ceilings	Temper-Tone 360 tile which allows access to the plenum.
34	Ventilating Ceilings	Temper-Tone 360 and Acousti-Clad tiles through-perforated to allow passage of conditioned air.
38	Thermal-Acoustical Batts	Low density, resilient fiber glass thermal-acoustical insulation for ceilings.
39	Sound Control Blankets	Low density, resilient fiber glass thermal-acoustical insulation for steel stud walls.

Physical Properties

Page	Product	Thickness	Nominal Sizes	Edge Types*	Suspension Type	Light Reflectance Rating (SS-S-118A)	Thermal Insulation "R" Value	Fed. Spec. SS-S-118A** Type Pattern	Flame Spread Index SS-S-118A	Fire Endurance Rating (Hours)
33	Access Tile	¾"	12" x 12" 12" x 24" 12" x 36"	KCB-4 or Special	Concealed	LR-1	1.88	III d	Class 25	—
12-13	Acousti-Clad® Firedike® Tile	⅝"	12" x 12"	BE KCB-4	Concealed or Cemented	LR-2	1.56	IX a, b, c	Class 25	2, 1½
12-13	Acousti-Clad Perlite Core Tile	⅞"	12" x 12"	BE KCB-4	Concealed or Cemented	LR-2	2.43	IX a, b	Class 25	—
12-13	Acousti-Clad Spintone® Core Tile	⅝"	12" x 12"	BE KCB-4	Concealed or Cemented	LR-2	1.56	IX a, b, c	Class 25	—
14-15	Acousti-Shell® Panels	⅛"	24" x 24" 24" x 48" 48" x 48"	SE	Exposed	LR-1	.51	III f	Class 25	—
20-21	Duratone™ Panels	⅝"	24" x 24" 48" x 48"	SE	Exposed	LR-2	1.56	IX c, f	Class 25	—
26-30	Firedike Tile and Panels	⅝" ¾"	12" x 12" 12" x 24" 24" x 24" 24" x 36" 24" x 48"	Various	Exposed or Concealed	LR-1	⅝"-1.56 ¾"-1.88	III a, b, c, d IX	Class 25	Tile 3, 2, 1½, 1 Panels 2, 1½, 1
32	Open-Plan™ Span-Acoustic® Panels	1½"	24" x 24" 24" x 48" 48" x 48" 60" x 60"	SE	Exposed	LR-1	1½"-6.12	IV c, f	Class 25	—
22-23	Particle-Gard LPC® Firedike Panels	⅝"	24" x 24" 24" x 48"	SE	Exposed	LR-1	1.56	III c	Class 25	2, 1½, 1
14-15	Prismatic® Panels	⅛"	48" x 48"	SE	Exposed	LR-1	.51	III f	Class 25	—
14-15	Profile® Panels	⅛"	24" x 24"	SE	Exposed	LR-1	.51	III f	Class 25	—
16-17	Quadrette® Panels	¾" ⅝"	24" x 24" 24" x 48"	Rabbeted	Exposed	LR-1	⅝"-1.56 ¾"-1.88	III d	Class 25	2, 1½ (Firedike)
39	Sound Control Blankets	2¾" 4"	16" and 24" wide	—	—	—	2¾"-7 4"-11	— —	Class 25***	—
24-25	SpanAcoustic Panels	1" 1½"	24" x 24" 24" x 48" 48" x 48" 60" x 60"	SE	Exposed	LR-1	1"-4.08 1½"-6.12	IV f	Class 25	—
24-25	SpanCore® Panels	¾" 1"	24" x 24" 24" x 48"	SE	Exposed	LR-1	¾"-3.06 1"-4.08	IV f	—	—
18-19	Spintone® Panels	⅝"	24" x 24" 24" x 36" 24" x 48" 24" x 60"	SE	Exposed	LR-1	1.56	III c, d, f	Class 25	—
8-9	Temper-Tone® Tile	¾"	12" x 12" 12" x 24" 12" x 36"	BE TGK BE KCB-4 SE TGK	Concealed or Cemented	LR-1	1.88	III d	Class 25	—
10-11	Tenu-Tone® Tile	⅝	12" x 12"	BE KCB-4	Concealed or Cemented	LR-1	1.56	III a, b, c, d	Class 25	—
38	Thermal Acoustical Batts	4" 6½"	24" x 48"	—	—	—	4"-11 6½"-19	— —	Class 25 Unfaced***	—
34	Ventilating Ceiling Systems		12" x 12" 12" x 24"	Various	Concealed	LR-1	—	III d	Class 25	2 (Firedike Tile)

*Edge Detail: BE — Beveled Edge; SE — Square Edge; — KCB-4 — Kerfed and cut back 4 sides; TGK — Tongue and grooved edges.

**Types: III — Mineral Composition; IV — Plastic Membrane-Mineral Composition; IX — Special

**Patterns: a — Regularly large hole perforated; b — Randomly large hole perforated; c — Finely perforated; d — Fissured (or fissured and finely perforated); f — Textured.

Technical Data

Sound Absorption Coefficients

Page	Product	Thickness	Mounting	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	NRC Range
12-13	ACOUSTI-CLAD® FIREDIKE® Tile Diagonal Perforated	5/8"	7	.35	.31	.49	.75	.74	.56	.50-.60
12-13	ACOUSTI-CLAD Perlite Core Tile Diagonal Perforated	7/8"	1 7	.19 .39	.35 .36	.61 .43	.64 .54	.59 .60	.45 .49	.50-.60 .45-.55
12-13	ACOUSTI-CLAD Spintone® Core Tile Diagonal Perforated Delta	5/8" 5/8"	7 7	.33 .34	.32 .34	.52 .47	.85 .69	.80 .73	.59 .59	.55-.65 .50-.60
14-15	ACOUSTI-SHELL® Panels Vault	1/8"	7	.64	.72	.61	.68	.79	.72	.65-.75
20-21	DURATONE™ Panels Pierced Pattern	5/8"	7	.32	.32	.59	.94	.71	.52	.60-.70
26-30	FIREDIKE Panels Pierced Pattern	5/8"	7	.33	.35	.54	.90	.81	.57	.60-.70
26-30	FIREDIKE Panels 360 Pattern	5/8"	7	.32	.27	.51	.77	.73	.71	.55-.65
32	OPEN-PLAN SPANACOUSTIC® Panels	1½"	7	.75	.88	.77	.97	.88	.62	.85-.95
22-23	PARTICLE-GARD LPC® Firedike Panels	5/8"	7	.18	.33	.62	.60	.44	.26	.45-.55
14-15	PRISMATIC® Panels	1/8"	7	.63	.70	.61	.70	.78	.73	.65-.75
14-15	PROFILE® Panels	1/8"	7	.52	.67	.49	.61	.58	.58	.55-.65
16-17	QUADRETTE® Panels	3/4" 5/8"	7 7	.29 .27	.33 .30	.59 .54	.77 .74	.81 .79	.80 .77	.60-.70 .55-.65
24-25	SPANACOUSTIC Panels Canyon Pattern	1" 1½"	7 7	.75 .81	.82 .80	.71 .76	.83 .86	.67 .70	.35 .38	.70-.80 .75-.85
24-25	SPANCORE® Panels Pebble Pattern	1"	7	.67	.89	.68	.79	.66	.37	.70-.80
18-19	SPINTONE Panels 360 720 DCF Pierced Concord	5/8" 5/8" 5/8" 5/8" 5/8"	7 7 7 7 7	.26 .27 .30 .28 .27	.33 .28 .27 .28 .29	.57 .65 .67 .52 .70	.83 .83 .82 .87 .82	.84 .77 .73 .83 .67	.79 .85 .69 .58 .55	.60-.70 .60-.70 .55-.65 .60-.70 .55-.65
8-9	TEMPER-TONE® Tile 360 720 DCF	3/4" 3/4" 3/4"	1 7 7 7	.05 .42 .40 .32	.17 .42 .42 .39	.66 .70 .74 .74	.99 .91 .83 .74	.95 .86 .82 .78	.90 .97 .96 .91	.65-.75 .65-.75 .65-.75 .60-.70
10-11	TENU-TONE® Tile Pierced Omni	5/8" 5/8"	1 7 7	.03 .50 .32	.17 .39 .35	.64 .60 .54	.92 .90 .83	.68 .76 .85	.45 .53 .83	.55-.65 .60-.70 .60-.70
38	4" THERMAL-ACOUSTICAL Batts on 1½" SPANACOUSTIC Panels	5½"	7	.97	1.00	1.00	.88	.65	.40	.85-.95

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Sound Attenuation Factors

Page	Product	Thickness	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1000 Hz	1250 Hz	1600 Hz	2000 Hz	2500 Hz	3150 Hz	4000 Hz	Ceiling STC
12-13	ACOUSTI-CLAD® FIREDIKE® Tile — Diagonal Perforated	5/8"	32	38	41	33	36	38	39	42	43	44	48	51	54	54	55	56	40-44
12-13	ACOUSTI-CLAD Perlite Core Tile Diagonal Perforated	7/8"	31	37	40	33	36	39	40	44	46	48	50	55	57	57	58	59	45-49
12-13	ACOUSTI-CLAD Spintone® Core Tile Diagonal Perforated	5/8"	33	38	39	33	34	38	38	41	42	45	47	51	54	54	54	56	40-44
	Delta	5/8"	32	35	39	36	35	37	40	41	43	46	48	51	54	52	53	54	45-49
20-21	DURATONE™ Panels Pierced Pattern	5/8"	30	37	37	31	31	34	35	37	38	42	45	50	54	52	52	53	40-44
26-30	FIREDIKE Panels Pierced Pattern	5/8"	30	38	39	32	32	37	37	41	42	45	48	52	54	55	56	58	40-44
26-30	FIREDIKE Panels 360 Pattern	5/8"	29	36	37	29	29	32	33	37	38	41	44	49	53	54	56	58	35-39
22-23	PARTICLE-GARD LPC® FIREDIKE Panels	5/8"	34	42	41	34	36	41	43	46	49	53	54	57	58	57	56	57	45-49
16-17	QUADRETTE® Panels	3/4"	28	35	36	29	29	34	36	38	41	42	42	44	46	46	46	47	40-44
		5/8"	29	36	36	30	29	32	32	34	36	38	41	45	49	50	52	53	35-39
18-19	SPINTONE Panels 360	5/8"	31	38	37	30	29	35	35	38	41	43	46	48	51	53	55	56	40-44
	720	5/8"	26	36	35	29	30	33	35	39	42	43	46	50	55	56	57	59	40-44
	Pierced	5/8"	31	36	37	30	30	34	34	36	38	41	44	49	55	57	58	59	40-44
8-9	TEMPER-TONE® Tile 360	3/4"	31	39	40	35	34	40	40	43	45	48	50	56	57	54	56	57	45-49
	720	3/4"	30	38	38	31	30	33	36	36	38	40	43	49	55	56	55	55	40-44
	DCF	3/4"	29	36	40	33	33	38	38	41	42	46	48	53	57	52	53	57	40-44
10-11	TENU-TONE® Tile Omni	5/8"	32	38	39	33	34	37	38	39	41	43	47	52	56	54	54	58	40-44

Codes, Acceptance, Availability

Code Acceptability
Individual J-M sound control products comply with the following standards:
Flame Spread Index — Federal Specification SS-S-118A, ASTM E-84.
Fire Endurance — ASTM E-119.
U.L. Fire Hazard Classification.
U.L. Fire Resistance Classification.

Warranty
All products sold are subject to the following warranty: J-M warrants for a period of one year from date of delivery that the product is free from defects in materials and workmanship. J-M MAKES NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, IN FACT OR IN LAW, INCLUDING WITHOUT LIMITATION THE WARRANTY OF MERCHANTABILITY OR THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, OTHER THAN THE LIMITED WARRANTY SET FORTH ABOVE. Every claim under this warranty shall be deemed waived unless in writing and received by J-M within thirty (30) days of the date the defect to which each claim relates is discovered or should have been discovered.

Availability and Cost
J-M sound control products are sold throughout the United States by a network of over 300 qualified acoustical contractors and wholesale distributors. Contact the nearest Johns-Manville office for the name of the qualified acoustical contractor nearest you. Or check the Yellow pages in your telephone directory.

Specifications
J-M sound control products are classified by type under Federal specifications as follows:

Spec. No. & Title	Type	Product
SS-S-118A & Interim Amendment 3 (6/14/72)	III	Firedike Tile and Panels Spintone Panels Quadrette Panels
Sound Control Blocks & Boards (Acoustical tiles and panels, prefabricated).		Temper-Tone Tile Tenu-Tone Tile
	IV	SpanAcoustic Panels SpanCore Panels
	IX	Acousti-Clad Tile Duratone Panels Sculptured Fiber Glass Panels
HH-I-521E	I	Sound Control Blankets Unfaced Thermal Acoustical Batts
Insulation Blankets, Thermal (Mineral fiber, for ambient temperatures).	II	Faced Thermal Acoustical Batts

Johns-Manville

Guide Specification

For Temper-Tone® and Tenu-Tone® Tiles

Note to the specifier: Delete sections not used; fill in correct selections where indicated and/or add other information as required.

I. Scope

A. The general conditions in Division I of this specification form an integral part of the contract for the work specified in this section and all conditions contained therein shall be binding upon the contractor and shall govern the work.

B. The installation of all suspension systems and acoustical materials covered in this section shall be by a qualified acoustical subcontractor.

C. No substitutions will be permitted for materials and methods covered in this section.

D. It is the responsibility of the acoustical subcontractors to obtain all required licenses and permits necessary for prosecution of the acoustical work specified herein.

II. Work Included

A. The work under this section of the specifications shall include furnishing all supervision, labor, materials, tools and equipment and performing all operations necessary for the complete execution of the acoustical ceiling systems as described in the drawings and specifications in a first class workmanship manner as stated in the Ceiling and Interior Systems Contractors Association (CISCA) handbook for acoustical ceiling system installations.

III. General Requirements

A. Job Conditions:

Installation of acoustical units must not begin until the conditions comply with those stated in the current Acoustical and Board Products Association (ABPA) Bulletin, installation recommendations section, "Job Conditions."

B. Receiving and storing materials: All materials must be delivered in original unopened packages with manufacturer's name and contents legibly indicated and stored in a safe enclosed area protected from damage until ready for use.

C. Preparatory work: The acoustical contractor shall be responsible for inspecting and accepting all areas to receive acoustical treatment as to proper job conditions and coordination of work of other trades. All work of other trades in the plenum space to be concealed by the acoustical ceiling must be inspected and approved by those having jurisdiction, and execution of the ceiling installation shall not proceed until so authorized.

IV. Materials

A. Acoustical tile shall be Johns-Manville (Temper-Tone, Tenu-Tone) mineral fiber tile, (pattern name) surface pattern, (length x width) and (thickness) thick. Edge detail shall be (specify) with special (specify) treatments.

B. (1) Suspension system for mounting acoustical tile shall be (concealed, semi-concealed) type, (manufacturer's designation) as manufactured by (name of manufacturer), shall be suitable for the acoustical material specified and shall conform to ASTM Standard C635-69, (light-duty, intermediate-duty, heavy-duty). Color and finish of exposed metal shall be (specify).

B. (2) Adhesive for mounting acoustical tile shall conform to interim Federal Specification MMM-A-00150a.

V. Installation

A. (1) Installation of the suspension system shall be in strict accordance with the Recommended Practice of ASTM C636-69 and the current ABPA bulletin.

A. (2) Cement-applied tiles shall be applied to a properly prepared, clean, dry, level surface.

B. Acoustical units (and suspension system) shall be installed in accordance with the layout shown in the drawings. The system shall use border units of the greatest possible size, all lines shall be true and straight and completed ceilings shall be in perfect alignment and on a level plane.

C. Acoustical units shall be (cement-applied, installed in suspension system) in accordance with manufacturer's instructions and best commercial practice.

VI. Cleaning

A. After installation is completed, (suspension system and) acoustical units shall be cleaned where soiled and touched up where scratched or scuffed with appropriate paint.

B. Any defective, soiled or improperly installed components which cannot be satisfactorily corrected shall be replaced with new materials.

C. Upon completion of the various portions of the installations, the contractor shall remove all unused materials, rubbish and equipment which have accumulated as a result of the work.

Guide Specification

For Quadrette,® Spintone,® and Duratone™ Lay-In Panels

Note to the specifier: Delete sections not used; fill in correct selections where indicated and/or add other information as required.

I. Scope

A. The general conditions in Division I of this specification form an integral part of the contract for the work specified in this section and all conditions contained therein shall be binding upon the contractor and shall govern the work.

B. The installation of all suspension systems and acoustical materials covered in this section shall be by a qualified acoustical subcontractor.

C. No substitutions will be permitted for materials and methods covered in this section.

D. It is the responsibility of the acoustical subcontractors to obtain all required licenses and permits necessary for prosecution of the acoustical work specified herein.

II. Work Included

A. The work under this section of the specifications shall include furnishing all supervision, labor, materials, tools and equipment and performing all operations necessary for the complete execution of the acoustical ceiling systems as described in the drawings and specifications in a first class workmanship manner as stated in the Ceiling and Interior Systems Contractors Association (CISCA) handbook for acoustical ceiling system installations.

III. General Requirements

A. Job Conditions:

Installation of acoustical units must not begin until the conditions comply with those stated in the current Acoustical and Board Products Association (ABPA) Bulletin, installation recommendations section, "Job Conditions."

B. Receiving and storing materials: All materials must be delivered in original unopened packages with manufacturer's name and contents legibly indicated and stored in a safe enclosed area protected from damage until ready for use.

C. Preparatory work: The acoustical contractor shall be responsible for inspecting and accepting all areas to receive acoustical treatment as to proper job conditions and coordination of work of other trades. All work of other trades in the plenum space to be concealed by the acoustical ceiling must be inspected and approved by those having jurisdiction, and execution of the ceiling installation shall not proceed until so authorized.

IV. Materials

A. Acoustical lay-in panels shall be Johns-Manville (Quadrette, Spintone and Duratone) felted mineral fiber panels, (pattern name) surface pattern, (length x width) and (thickness) thick. Finish shall be (specify) with special (specify) treatment.

B. Suspension system for mounting acoustical lay-in panels shall be exposed grid type, (manufacturer's designation) as manufactured by (name of manufacturer), shall be suitable for the acoustical material specified and shall conform to ASTM Standard C635-69, (light-duty, intermediate-duty, heavy-duty). Color and finish of exposed metal shall be (specify).

V. Installation

A. Installation of the suspension system shall be in strict accordance with ASTM Standard C636-69 and the current ABPA bulletin.

B. Acoustical units and suspension system shall be installed in accordance with the layout shown in the drawings. The system shall use border units of the greatest possible size, all lines shall be true and straight and completed ceilings shall be in perfect alignment and on a level plane.

C. Acoustical units shall be installed in suspension system in accordance with manufacturer's instructions and best commercial practice.

VI. Cleaning

A. After installation is complete, suspension system and acoustical units shall be cleaned where soiled and touched up where scratched or scuffed with appropriate paint.

B. Any defective, soiled or improperly installed components which cannot be satisfactorily corrected shall be replaced with new materials.

C. Upon completion of the various portions of the installations, the contractor shall remove all unused materials, rubbish and equipment which have accumulated as a result of the work.

Johns-Manville

Guide Specification

For Firedike® Systems

Note to the specifier: Delete sections not used: fill in correct selections where indicated and/or add other information as required.

I. Scope

A. The general conditions in Division I of this specification form an integral part of the contract for the work specified in this section and all conditions contained therein shall be binding upon the contractor and shall govern the work.

B. The installation of all suspension sytems and acoustical materials covered in this section shall be by a qualified acoustical subcontractor.

C. No substitutions will be permitted for materials and methods covered in this section.

D. It is the responsibility of the acoustical subcontractors to obtain all required licenses and permits necessary for prosecution of the acoustical work specified herein.

II. Work Included

A. The work under this section of the specifications shall include furnishing all supervision, labor, materials, tools and equipment and performing all operations necessary for the complete execution of the acoustical ceiling systems as described in the drawings and specifications in a first class workmanship manner as stated in the Ceiling and Interior Systems Contractors Association (CISCA) handbook for acoustical ceiling system installations.

III. General Requirements

A. Job Conditions:

Installation of acoustical units must not begin until the conditions comply with those stated in thc current Acoustical and Board Products Association (ABPA) Builetin, installation recommendations section, "Job Conditions."

B. Receiving and storing materials: All materials must be delivered in original unopened packages with manufacturer's name and contents legibly indicated and stored in a safe enclosed area protected from damage until ready for use.

C. Preparatory work: The acoustical contractor shall be responsible for inspecting and accepting all areas to receive acoustical treatment as to proper job conditions and coordination of work of other trades. All work of other trades in the plenum space to be concealed by the acoustical ceiling must be inspected and approved by those having jurisdiction, and execution of the ceiling installation shall not proceed until so authorized.

IV. Materials

A. (1)Acoustical tile shall be Johns-Manville Firedike mineral fiber tile, (pattern name) surface pattern, (length x width) (nominal) and (thickness) thick. Edge detail shall be (specify). Finish shall be (specify) with special (specify) treatments.

A. (2) Acoustical tile shall be Johns-Manville Acousti-Clad Firedike aluminum-clad felted mineral fiber tile (pattern name) surface pattern, in (color name) color, 12" x 12" x 5/8" thick with KCB-4 edge detail.

A. (3) Acoustical lay-in panels shall be Johns-Manville (Quadrette Firedike, Firedike) felted mineral fiber panels, (pattern name) surface pattern, (length x width) and (thickness) thick. Finish shall be (specify) with special (specify) treatment.

B. Suspension system for mounting acoustical (tile, lay-in panels) shall be (concealed or exposed grid) type, (manufacturer's designation) as manufactured by (name of manufacturer), shall be suitable for the acoustical material specified and shall conform to ASTM Standard C635-69, (light-duty, intermediate-duty, heavy-duty). Color and finish of exposed metal shall be (specify). Suspension system shall also conform to Underwriters' Laboratories _____ hour Time Design No. _____.

V. Installation

A. Installation of the suspension system shall be in strict accordance with the Recommended Practice of ASTM Standard C636-69 and the current ABPA bulletin. Installation of all component parts shall be in accordance with Underwriters' Laboratories Time Design No. _____ to achieve the specified fire-resistive time design rating of _____ hour.

B. Acoustical units and suspension system shall be installed in accordance with thc layout shown in the drawings. The system shall use border units of the greatest possible size, all lines shall be true and straight and completed ceilings shall be in perfect alignment and on a level plane.

VI. Cleaning

A. After installation is completed, suspension system and acoustical units shall be cleaned where soiled and touched up where scratched or scuffed with appropriate paint.

B. Any defective, soiled or improperly installed components which cannot be satisfactorily corrected shall be replaced with new materials.

C. Upon completion of the various portions of the installations, the contractor shall remove all unused materials, rubbish and equipment which have accumulated as a result of the work.

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Guide Specification

For Particle-Gard LPC® Firedike® Panels

Note to the specifier: Delete sections not used; fill in correct selections where indicated and/or add other information as required.

I. Scope

A. The general conditions in Division I of this specification form an integral part of the contract for the work specified in this section and all conditions contained therein shall be binding upon the contractor and shall govern the work.

B. The installation of all suspension systems and acoustical materials covered in this section shall be by a qualified acoustical subcontractor.

C. No substitutions will be permitted for materials and methods covered in this section.

D. It is the responsibility of the acoustical subcontractors to obtain all required licenses and permits necessary for prosecution of the acoustical work specified herein.

II. Work Included

A. The work under this section of the specifications shall include furnishing all supervision, labor, materials, tools and equipment and performing all operations necessary for the complete execution of the acoustical ceiling systems as described in the drawings and specifications in a first class workmanship manner as stated in the Ceiling and Interior Systems Contractors Association (CISCA) handbook for acoustical ceiling system installations.

III. General Requirements

A. Job Conditions:

Installation of acoustical units must not begin until the conditions comply with those stated in the current Acoustical and Board Products Association (ABPA) Bulletin, installation recommendations section, "Job Conditions."

B. Receiving and storing materials: All materials must be delivered in original unopened packages with manufacturer's name and contents legibly indicated and stored in a safe area protected from damage until ready for use.

C. Preparatory work: The acoustical contractor shall be responsible for inspecting and accepting all areas to receive acoustical treatment as to proper job conditions and coordination of work of other trades. All work of other trades in the plenum space to be concealed by the acoustical ceiling must be inspected and approved by those having jurisdiction, and execution of the ceiling installation shall not proceed until so authorized.

IV. Materials

A. Acoustical lay-in panels shall be Johns-Manville Particle-Gard LPC Firedike panels, (length x width) and (thickness) thick.

B. Suspension systems for mounting acoustical lay-in panels shall be (manufacturer's designation) as manufactured by (name of manufacturer), shall be suitable for the acoustical material specified and shall conform to ASTM Standard C635-69, (light-duty, intermediate-duty, heavy-duty). Grid flanges shall be gasketed with a thick, resilient closed cell foam gasketing material (3M Gasket-4308 or equal) and hold down clips shall be used to install panels in order to insure minimum air leakage and a positive, visual seal. Color and finish of exposed metal shall be (specify).

V. Installation

A. Installation of the suspension system shall be in strict accordance with the Recommended Practice of ASTM Standard C636-69 and the current ABPA bulletin.

B. Acoustical units and suspension system shall be installed in accordance with the layout shown in the drawings. The system shall use border units of the greatest possible size, all lines shall be true and straight and completed ceilings shall be in perfect alignment and on a level plane.

C. Acoustical units shall be installed in suspension system in accordance with manufacturer's instructions and best commercial practice. Edges of field-cut panels shall be treated with J-M Particle-Gard LPC Firedike Edge Sealer to preserve Class 100 panel rating.

VI. Cleaning

A. After installation is completed, suspension system and acoustical units shall be cleaned where soiled and touched up where scratched or scuffed with appropriate paint.

B. Any defective, soiled or improperly installed components which cannot be satisfactorily corrected shall be replaced with new materials.

C. Upon completion of the various portions of the installations, the contractor shall remove all unused materials, rubbish and equipment which have accumulated as a result of the work.

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Johns-Manville

Guide Specification

For Acousti-Clad® Tile

Note to the specifier: Delete sections not used; fill in correct selections where indicated and/or add other information as required.

I. Scope

A. The general conditions in Division I of this specification form an integral part of the contract for the work specified in this section and all conditions contained therein shall be binding upon the contractor and shall govern the work.

B. The installation of all suspension systems and acoustical materials covered in this section shall be by a qualified acoustical subcontractor.

C. No substitutions will be permitted for materials and methods covered in this section.

D. It is the responsibility of the acoustical subcontractors to obtain all required licenses and permits necessary for prosecution of the acoustical work specified herein.

II. Work Included

A. The work under this section of the specifications shall include furnishing all supervision, labor, materials, tools and equipment and performing all operations necessary for the complete execution of the acoustical ceiling systems as described in the drawings and specifications in a first class workmanship manner as stated in the Ceiling and Interior Systems Contractors Association (CISCA) handbook for acoustical ceiling system installations.

III. General Requirements

A. Job Conditions:

Installation of acoustical units must not begin until the conditions comply with those stated in the current Acoustical and Board Products Association (ABPA) Bulletin, installation recommendations section, "Job Conditions."

B. Receiving and storing materials: All materials must be delivered in original unopened packages with [illegible] and contents legibly identified and stored in a safe enclosed area protected from damage until ready for use.

C. Preparatory work: The acoustical contractor shall be responsible for inspecting and accepting all areas to receive acoustical materials as to proper job conditions and coordination of work of other trades. All work of other trades in the plenum space to be concealed by the acoustical ceiling must be inspected and approved by those having jurisdiction, and execution of the ceiling installation shall not proceed until so authorized.

IV. Materials

A. Acoustical tile shall be Johns-Manville Acousti-Clad aluminum clad felted mineral tile (pattern name) surface pattern, (core name) core, (color name) color, 12" x 12" x (thickness) thick with KCB-4 edge detail.

B. (1) Suspension system for mounting acoustical tile shall be (concealed) type, (manufacturer's designation) as manufactured by (name of manufacturer), shall be suitable for the acoustical material specified and shall conform to ASTM Standard C635-69, (light-duty, intermediate-duty, heavy-duty). Color and finish of exposed metal shall be (specify).

B. (2) Adhesive for mounting acoustical tile shall conform to interim Federal Specification MMM-A-00150a.

V. Installation

A. (1) Installation of the suspension system shall be in strict accordance with the Recommended Practice of ASTM Standard C636-69 and the current ABPA bulletin.

A. (2) Cement-applied tiles shall be applied to a properly prepared, clean, dry, level surface.

B. Acoustical units (and suspension system) shall be installed in accordance with the layout shown in the drawings. The system shall use border units of the greatest possible size, all lines shall be true and straight and completed ceilings shall be in perfect alignment and on a level plane.

C. Acoustical units shall be (cement-applied, installed in suspension system) in accordance with manufacturer's instructions and best commercial practice.

VI. Cleaning

A. After installation is completed, (suspension system and) acoustical units shall be cleaned where soiled and touched up where scratched or scuffed with appropriate paint.

B. Any defective, soiled or improperly installed components which cannot be satisfactorily corrected shall be replaced with new materials.

C. Upon completion of the various portions of the installations, the contractor shall remove all unused materials, rubbish and equipment which have accumulated as a result of the work.

Guide Specification

For Sculptured Fiber Glass Lay-In Panels

Note to the specifier: Delete sections not used; fill in correct selections where indicated and/or add other information as required.

I. Scope

A. The general conditions in Division I of this specification form an integral part of the contract for the work specified in this section and all conditions contained therein shall be binding upon the contractor and shall govern the work.

B. The installation of all suspension systems and acoustical materials covered in this section shall be by a qualified acoustical subcontractor.

C. No substitutions will be permitted for materials and methods covered in this section.

D. It is the responsibility of the acoustical subcontractors to obtain all required licenses and permits necessary for prosecution of the acoustical work specified herein.

II. Work Included

A. The work under this section of the specifications shall include furnishing all supervision, labor, materials, tools and equipment and performing all operations necessary for the complete execution of the acoustical ceiling systems as described in the drawings and specifications in a first class workmanship manner as stated in the Ceiling and Interior Systems Contractors Association (CISCA) handbook for acoustical ceiling system installations.

III. General Requirements

A. Job Conditions

Installation of acoustical units must not begin until the conditions comply with those stated in the current Acoustical and Board Products Association (ABPA) Bulletin, installation recommendation section, "Job Conditions."

B. Receiving and storing materials: All materials must be delivered in original unopened packages with manufacturer's name and contents legibly indicated and stored in a safe enclosed area protected from damage until ready for use.

C. Preparatory work: The acoustical contractor shall be responsible for inspecting and accepting all areas to receive acoustical treatment as to proper job conditions and coordination of work of other trades. All work of other trades in the plenum space to be concealed by the acoustical ceiling must be inspected and approved by those having jurisdiction, and execution of the ceiling installation shall not proceed until so authorized.

IV. Materials

A. Acoustical lay-in panels shall be Johns-Manville (Prismatic®, Profile®, Acousti-Shell®) sculptured fiber glass panels, (length x width). Matching textured border flats shall be used for cut borders or where pendant fixtures, speaker grilles, air diffusers or other apparatus are installed.

B. Suspension system for mounting acoustical lay-in panels shall be exposed grid type, (manufacturer's designation) as manufactured by (name of manufacturer), shall be suitable for the acoustical material specified and shall conform to ASTM Standard C635-69, (light-duty, intermediate-duty, heavy-duty). Color and finish of exposed metal shall be (specify).

V. Installation

A. Installation of the suspension system shall be in strict accordance with the Recommended Practice of ASTM Standard C636-69 and the current ABPA bulletin.

B. Acoustical units and suspension system shall be installed in accordance with the layout shown in the drawings. The system shall use border units of the greatest possible size, all lines shall be true and straight and completed ceilings shall be in perfect alignment and on a level plane.

C. Acoustical units shall be installed in suspension system in accordance with manufacturer's instructions and best commercial practice.

VI. Cleaning

A. After installation is completed, suspension system and acoustical units shall be cleaned where soiled and touched up where scratched or scuffed with appropriate paint.

B. Any defective, soiled or improperly installed components which cannot be satisfactorily corrected shall be replaced with new materials.

C. Upon completion of the various portions of the installation, the contractor shall remove all unused materials, rubbish and equipment which have accumulated as a result of the work.

Johns-Manville

Guide Specification

For SpanAcoustic® and SpanCore® Lay-In Panels

Note to the specifier: Delete sections not used; fill in correct selections where indicated and/or add other information as required.

I. Scope

A. The general conditions in Division I of this specification form an integral part of the contract for the work specified in this section and all conditions contained therein shall be binding upon the contractor and shall govern the work.

B. The installation of all suspension systems and acoustical materials covered in this section shall be by a qualified acoustical subcontractor.

C. No substitutions will be permitted for materials and methods covered in this section.

D. It is the responsibility of the acoustical subcontractors to obtain all required licenses and permits necessary for prosecution of the acoustical work specified herein.

II. Work Included

A. The work under this section of the specifications shall include furnishing all supervision, labor, materials, tools and equipment and performing all operations necessary for the complete execution of the acoustical ceiling systems as described in the drawings and specifications in a first class workmanship manner as stated in the Ceilings and Interior Systems Contractors Association (CISCA) handbook for acoustical ceiling system installations.

III. General Requirements

A. Job Conditions:

Installation of acoustical units must not begin until the conditions comply with those stated in the current Acoustical and Board Products Association (ABPA) bulletin, installation recommendations section, "Job Conditions."

B. Receiving and storing materials. All materials must be delivered in original unopened packages with manufacturer's name and contents legibly indicated and stored in a safe enclosed area protected from damage until ready for use.

C. Preparatory work: The acoustical contractor shall be responsible for inspecting and accepting all areas to receive acoustical treatment as to proper job conditions and coordination of work of other trades. All work of other trades in the plenum space to be concealed by the acoustical ceiling must be inspected and approved by those having jurisdiction, and execution of the ceiling installation shall not proceed until so authorized.

IV. Materials

A. Acoustical lay-in panels shall be Johns-Manville (SpanAcoustic, SpanCore) vinyl-faced glass fiber panels, (pattern name) pattern, (specify) color, (length x width) and (thickness) thick.

B. Suspension system for mounting acoustical lay-in panels shall be exposed grid type, (manufacturer's designation) as manufactured by (name of manufacturer), shall be suitable for the acoustical material specified and shall conform to ASTM Standard C635-69, (light-duty, intermediate-duty, heavy-duty). Color and finish of exposed metal shall be (specify).

V. Installation

A. Installation of the suspension system shall be in strict accordance with the Recommended Practice of ASTM Standard C636-69 and the current ABPA bulletin.

B. Acoustical units and suspension systems shall be installed in accordance with the layout shown in the drawings. The system shall use border units of the greatest possible size, all lines shall be true and straight and completed ceilings shall be in perfect alignment and on a level plane.

C. Acoustical units shall be installed in suspension system in accordance with manufacturer's instructions and best commercial practice.

VI. Cleaning

A. After installation is compiete, suspension system and acoustical units shall be cleaned where soiled.

B. Any defective, soiled or improperly installed components which cannot be satisfactorily corrected shall be replaced with new materials.

C. Upon completion of the various portions of the installations, the contractor shall remove all unused materials, rubbish and equipment which have accumulated as a result of the work.

Integrated Ceiling Systems



Johns-Manville

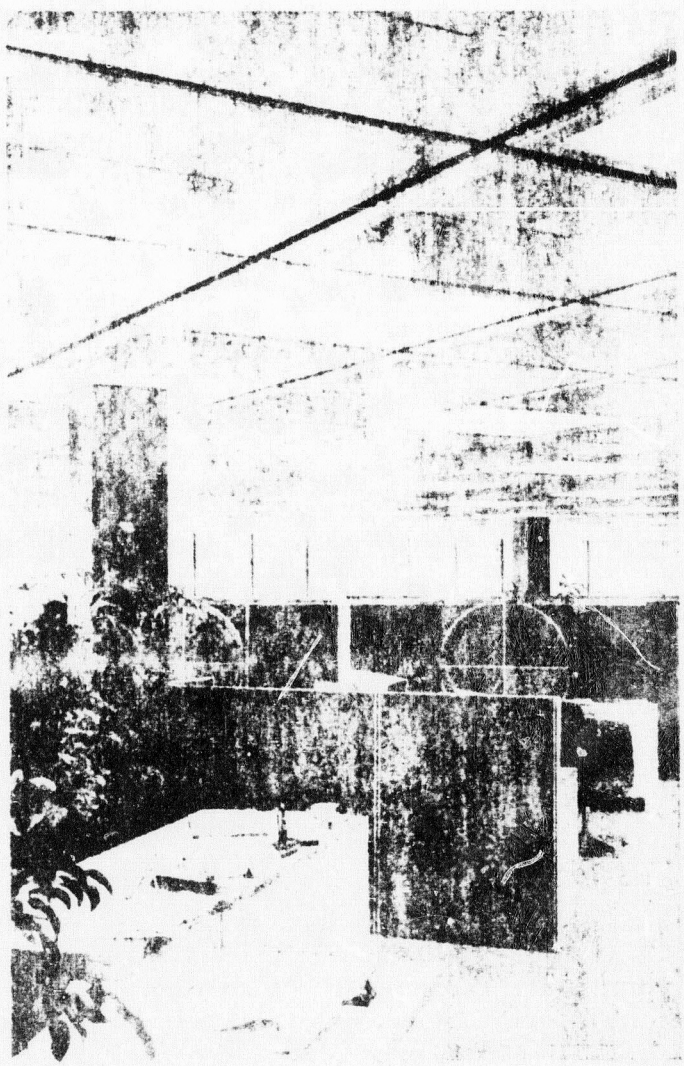
Integrated Ceiling Systems

Besides conventional acoustical tiles and panels, J-M also offers the specifier a comprehensive selection of pre-engineered, factory-built integrated ceiling systems.

J-M Integrated Ceiling Systems combine top-quality components into systems that perform to the maximum in lighting, air distribution and acoustical efficiency, and have the added benefit of outstanding appearance. Each J-M integrated ceiling has a distinctive look that will help you maximize the aesthetic potential of every space you design. And one manufacturer, Johns-Manville, stands behind the total system and all its components.

Several ceiling systems are available with virtually all popular module sizes accommodated, including the popular 2' x 4' and 5' x 5' modules.

For more information refer to the J-M Integrated Ceiling Systems insert 13.5/Jo of the Sweet's Architectural File.



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Exhibit D Annexed to Affidavit of John D. Jacobson

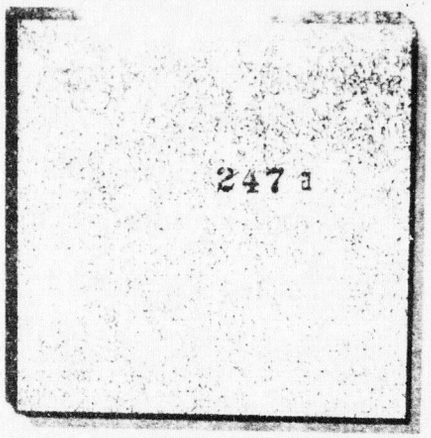
Armstrong Sales Brochure—The Ceiling Renaissance;
Armstrong Sales Brochure—Tone

246 a



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ANTIQUE GLASS



More than just sparkle and excitement. Antique Glass gives new geometry to a room or area. It combines the unique visual appeal of a mirrored surface with the practical benefits of acoustical properties and fire resistance.

Antique Glass is a polyester film-faced 12" x 12" x 5/8" tongue-and-groove tile which can be installed in a standard concealed suspension system.

Noise-Reduction Coefficient	.50-.60
Sound-Transmission Coefficient	35-39[1]
	40-44[2]
Flame-Spread Rating	Class 25
Insulation Value--Average C factor (at 75 F) is .70	

CORKSTYLE



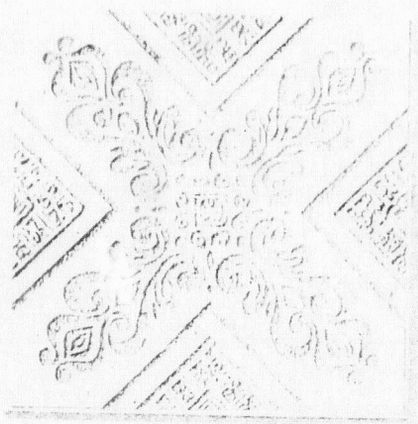
Corkstyle has the natural look and texture that complement today's mood-setting decors. But besides being visually appealing, Corkstyle's rugged surface and natural shading are both acoustical and noncombustible. Corkstyle is a 24" x 24" x 3/4" Tegular lay-in panel easily installed in exposed grid systems. (For the best visual effect, black grid is recommended.)

Noise-Reduction Coefficient	.60-.70
Sound-Transmission Coefficient	35-39[1]
Flame-Spread Rating	Class 25
Insulation Value--Average C factor (at 75 F) is .50	

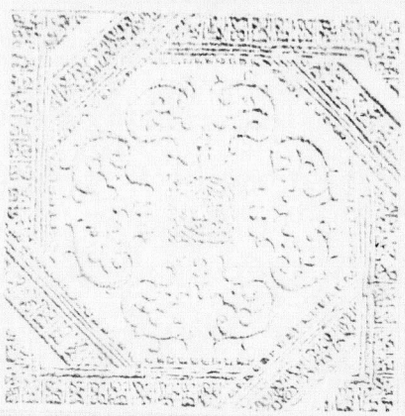
REGISTRY

Registry offers real decorative impact at heights of 14 and even 16 feet. Registry's large-scale design consists of two separate patterns (A & B) that combine with a special low-gloss grid to form an intricate overall effect. Registry is a 24" x 24" x 3/4" Tegular lay-in panel. (When installed, the complete visual simulates an interlocking grid system.) Registry combines traditional styling with contemporary technical requirements.

Noise-Reduction Coefficient	.60-.70
Sound-Transmission Coefficient	35-39[1]
	40-44[2]
Light Reflectance	LR 2 (70-74%)
Flame-Spread Rating	Class 25
Insulation Value--Average C factor (at 70 F) is .70	



Pattern A



Pattern B

GOLD LEAF

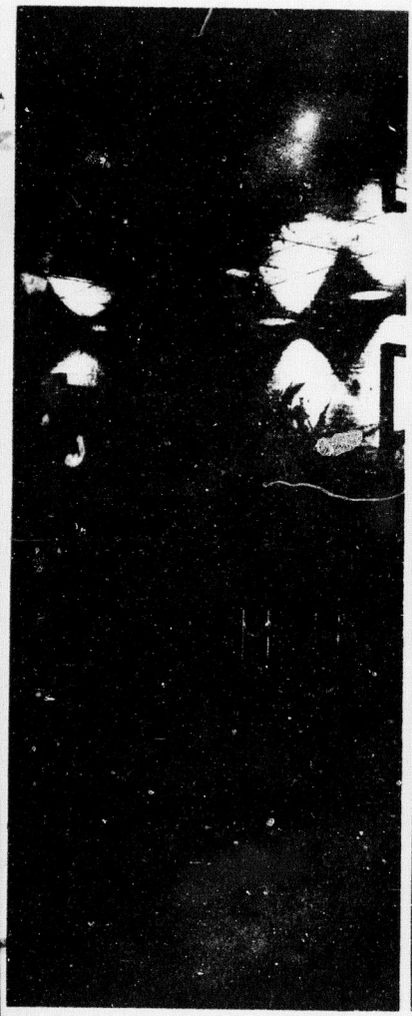


Elegance and classic features in a handcrafted look that runs the gamut of decorating styles. Gold Leaf is a polyester film-faced 12" x 12" x 5/8" tongue-and-groove tile which can be installed in standard concealed suspension systems.

Gold Leaf unites a classic ceiling style with acoustical properties and fire resistance.

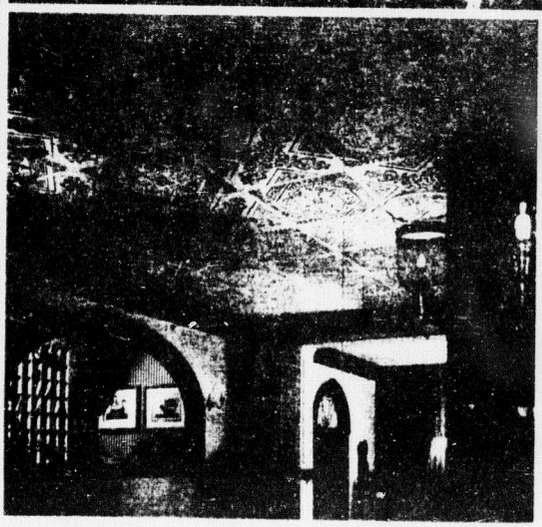
Noise-Reduction Coefficient	.50-.60
Sound-Transmission Coefficient	35-39[1]
	40-44[2]
Flame-Spread Rating	Class 25
Insulation Value—Average C factor (at 75 F) is .70	

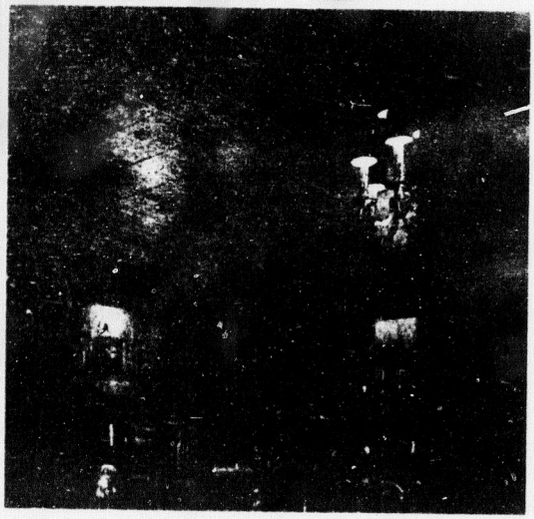
[1]Continuous Ceiling
[2]Continuous Ceiling with Attenu Guard Treatment





Armstrong





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The Ceiling Renaissance has arrived! It resurrects the decorative importance of the ceiling. It reaffirms the concept of the ceiling's being an integral component of a splendid interior. More than just a complement to walls and floors, the ceiling is once again an interior focal point.

Armstrong presents the Designer Series . . . a collection of unique visuals in acoustical mineral fiber ceilings.

SPECIFICATIONS

GOLD LEAF & ANTIQUE GLASS

1. Acoustical Materials
1.1 Acoustical materials shall be Armstrong Cork Company (Gold Leaf) (Antique Glass).
1.2 Acoustical materials shall be Type IV and Pattern g (Smooth) according to Federal Specification SS-S-118A; Tile Size—12" x 12"; Thickness—⅝"; Edge Detail—Tongue and Groove.
2. Suspension
2.1 Suspension system shall be Z, H, & T. Framing shall be ( ) gauge galvanized steel.
2.2 Matching wall molding shall detachably support framing.
2.3 Framing shall comply with ASTM C635 Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings. Suspension system shall be classified (light) (intermediate) (heavy) duty. (Framing shall be suitable for severe environmental conditions of high humidity and salt spray.)
3. Noise Control
3.1 Acoustical materials shall have Noise Reduction Coefficient (NRC) in the range .50-.60, according to ASTM C423 Sound Absorption of Acoustical Materials in Reverberation Rooms.
3.2 Ceiling Sound-Transmission Class (STC) shall be in the range (35-39) (40-44) according to AIMA 1-II Ceiling Sound-Transmission Test by Two-Room Method.
4. Fire Protection
4.1 Acoustical materials shall have Class 25 Flame-Spread Index according to Federal Specification SS-S-118A.
5. Installation
5.1 Install suspension system according to ASTM C636 Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
5.2 Support suspension system by 12-gauge hanger wires. Hangers shall be (cast-in-place hanger wires) (percussion hanger inserts) (other).
5.3 Install acoustical tile according to recommendations of Armstrong Cork Company.
5.4 Install access clips as indicated on plans.

REGISTRY

1. Acoustical Materials
1.1 Acoustical material shall be Armstrong Cork Company Registry.
1.2 Acoustical material shall be Type III and Pattern E (Embossed Design) according to Federal Specification SS-S-118A; Panel Size—24" x 24"; Thickness—¾"; Edge Detail—Tegular.
1.3 Acoustical material shall have washable, matte white finish with light reflectance of .70-.74 (70-74%) according to Federal Specification SS-S-118A.
2. Suspension
2.1 Exposed grid. Framing shall be ( ) gauge galvanized steel and shall be finished on exposed surfaces with low-gloss white enamel.
2.2 Matching wall molding shall detachably support framing.
2.3 Framing shall comply with ASTM C635 Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings. Suspension system shall be classified (light) (intermediate) (heavy) duty.
3. Noise Control
3.1 Acoustical material shall have Noise Reduction Coefficient (NRC) in the range .60-.70, according to ASTM C423 Sound Absorption of Acoustical Materials in Reverberation Rooms.
3.2 Ceiling Sound-Transmission Class (STC) shall be in the range .35-.39, (40-44) according to AIMA 1-II Ceiling Sound-Transmission Test by Two-Room Method.
4. Fire Protection
4.1 Acoustical material shall have Class 25 Flame-Spread Index according to Federal Specification SS-S-118A.
5. Installation
5.1 Install suspension system according to ASTM C636 Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
5.2 Support suspension system by 12-gauge hanger wires. Hangers shall be (cast-in-place hanger wires) (percussion hanger inserts) (other).
5.3 Install acoustical lay-in panel according to recommendations of Armstrong Cork Company.

CORKSTYLE

1. Acoustical Materials
1.1 Acoustical material shall be Armstrong Cork Company Corkstyle.
1.2 Acoustical material shall be Type III and Pattern f (Textured) according to Federal Specification SS-S-118A; Panel Size—24" x 24"; Thickness—¾"; Edge Detail—Tegular.
2. Suspension
2.1 Exposed grid. Framing shall be ( ) gauge galvanized steel and shall be finished on exposed surfaces with black enamel.
2.2 Matching wall molding shall detachably support framing.
2.3 Framing shall comply with ASTM C635 Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings. Suspension system shall be classified (light) (intermediate) (heavy) duty.
3. Noise Control
3.1 Acoustical material shall have Noise Reduction Coefficient (NRC) in the range .60-.70, according to ASTM C423 Sound Absorption of Acoustical Materials in Reverberation Rooms.
3.2 Ceiling Sound-Transmission Class (STC) shall be in the range 35-39, according to AIMA 1-II Ceiling Sound Transmission Test by Two Room Method.
4. Fire Protection
4.1 Acoustical material shall have Class 25 Flame Spread Index according to Federal Specification SS-S-118A.
5. Installation
5.1 Install suspension system according to ASTM C636 Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
5.2 Support suspension system by 12-gauge hanger wires. Hangers shall be (cast-in-place hanger wires) (percussion hanger inserts) (other).
5.3 Install acoustical lay-in panel according to recommendations of Armstrong Cork Company.

Armstrong

250 a

REGIONAL AND INTERNATIONAL OFFICES

REGIONAL OFFICES

ATLANTA, GA 30339
Suite 100
6640 Powers Ferry Road, N.W.

CINCINNATI, OH 45241
4100 Executive Park Drive

DALLAS, TX 75235
1420 Viceroy Drive

HONOLULU, HI 96814
King Center Building
1451 South King Street

KANSAS CITY, MO
P.O. Box 7290
Shawnee Mission, KS 66211

LOS ANGELES, CA
9700 Flair Drive
El Monte, CA 19731

NEW YORK, NY
Park 80 Plaza West—One
Garden State Parkway at Interstate 80
Saddle Brook, NJ 07662

PHILADELPHIA, PA
Executive Mall #6—Suite 130
676 Swedesford Road
Wayne, PA 19087

ST. LOUIS, MO 63105
222 South Meramec Avenue

SEATTLE, WA
1621—114th Avenue, S.E.
Suite 116
Bellevue, WA 98004

INTERNATIONAL OFFICES

AUSTRALIA
115-127 Wicks Road
North Ryde, N.S.W. 2113

BELGIUM
219, Rue Dieudonne Lefevre
1020 Brussels 2

HONG KONG
Caxton House
1, Duddell Street

CANADA
6911 Decarie Blvd
Montreal H3W 3E5, Quebec

IRELAND
Armstrong House
Robinhood Industrial Estate
Clondalkin, Co. Dublin

ITALY
Piazza 26 Maggio No. 9
21100 Varese

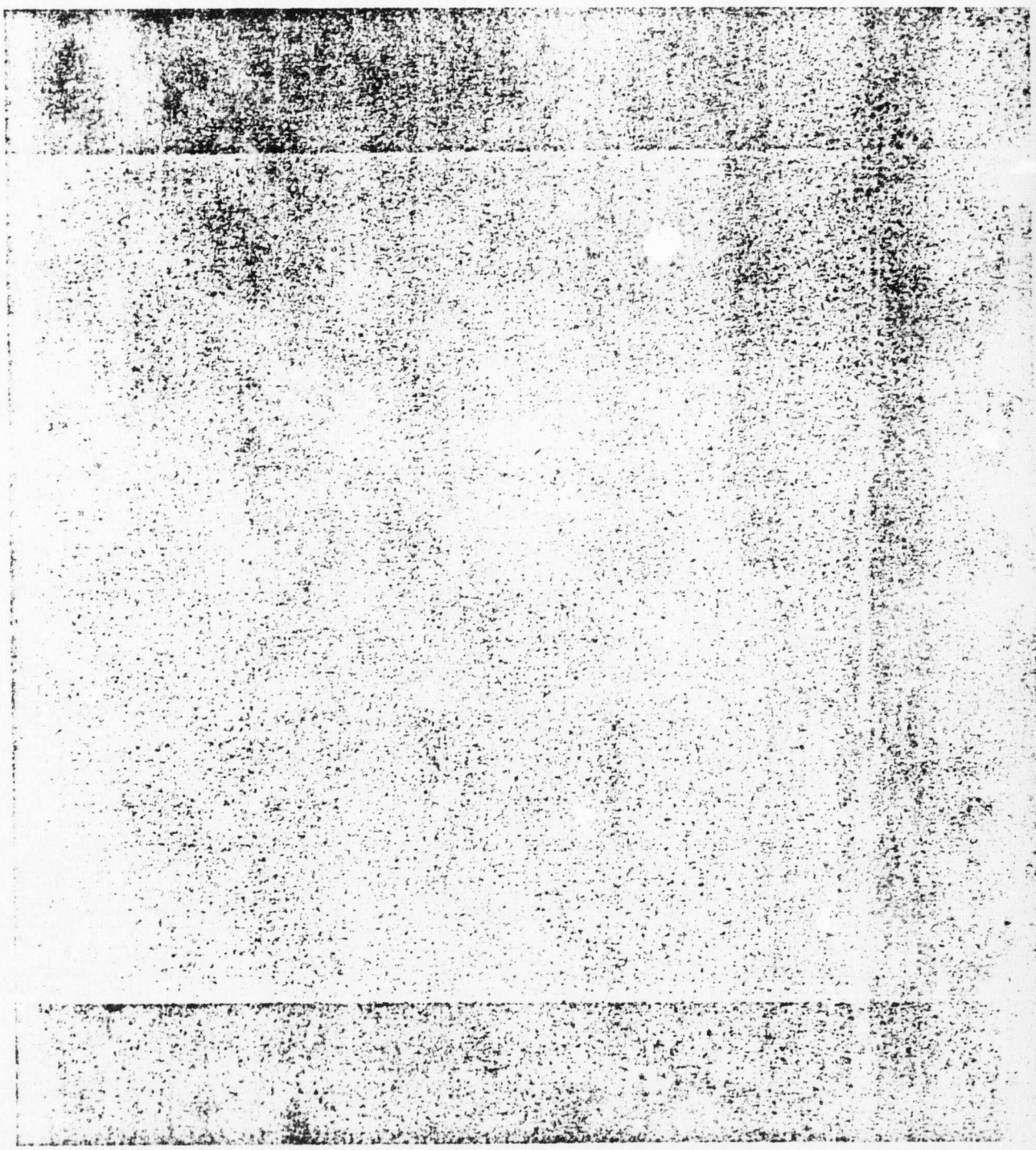
FRANCE
5, Rue Louis Lejeune
92128 Montrouge

PUERTO RICO 00920
1500 Roosevelt Avenue
San Juan

WEST GERMANY
Jan-Wellem Platz 1
4000 Dusseldorf

SPAIN
Avenida del Brasil No. 11
2ª Planta
Madrid 20

ENGLAND
Armstrong House
Chequers Square
Uxbridge, Middlesex



By use of various materials and techniques, both the artist and the architect strive to achieve certain visual effects. On our TONE cover, for example, artist David Brumbach employs metallic powders to create a surface that changes visually as the angle and intensity of the light change. Hard, uncomplicated edges concentrate viewer interest on the interior surface of his painting. In creating the small but highly individualistic buildings featured in this issue of TONE, the architects and designers use the tools and techniques of their profession to produce desired visual impressions, too. One architect designs a projecting panel to add a third dimension to an exterior wall. Another avoids a crowded effect on a small lot by making the building circular. Inside the buildings, Armstrong Ceilings and Ceiling Systems become essential design elements, chosen to create desired visual impressions as well as to perform the functional task of acoustical control—and in several instances, to incorporate the additional capabilities of lighting and air diffusion.

For a copy of the cover, unfolded and ready for framing, mail the return postcard inside the back cover.

Tone

Volume 24
Number 1
1976

A design journal
sent to you with
the compliments
of your contractor
for Armstrong
Ceiling Systems

Cover:
David Brumbach

Photography:
Lawrence S. Williams, Inc.

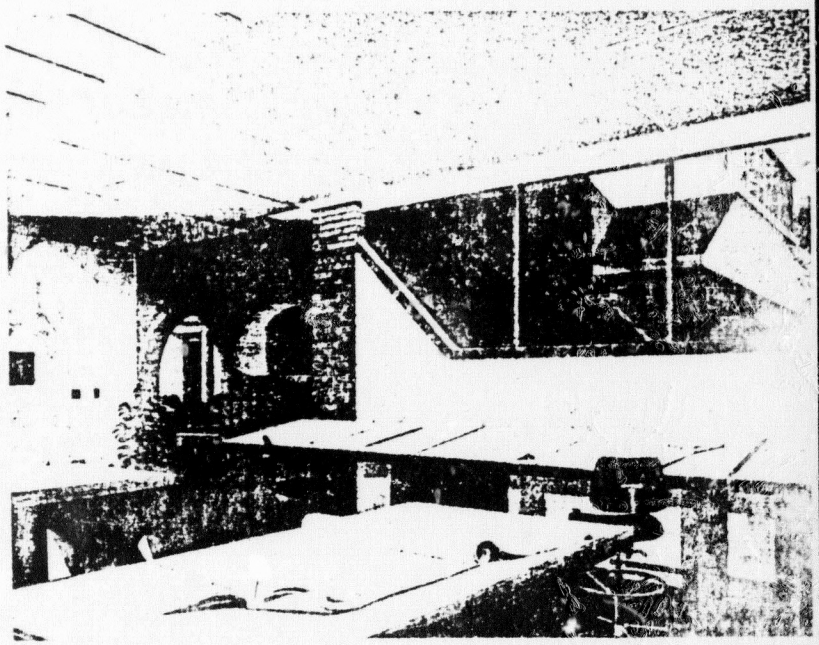
To visually reduce the mass of this new suburban office building, and thus lessen its impact on smaller neighboring structures, a projecting form of precast concrete panel was developed as the primary exterior wall treatment. Horizontal bands of these unusual panels add a third dimension to the wall plane and help the building maintain a low visual profile.

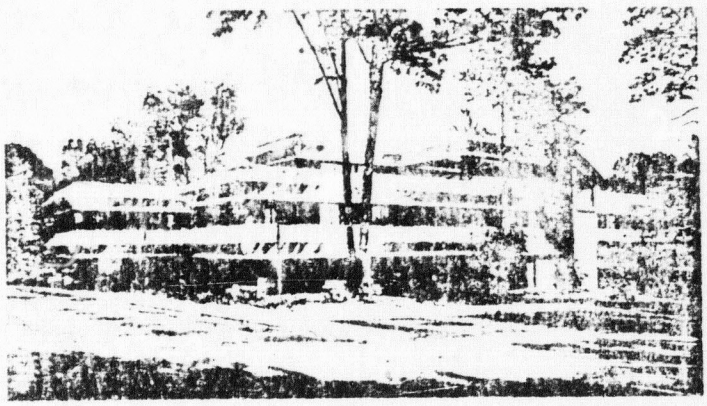
At strategic points, such as the entrance lobby, the horizontal planes are pierced with vertical brick masses which unify the total composition and also delineate certain internal areas. One of those spaces is the brick walled lobby. The sloping glass roof of this dramatic lobby area, plus glass ribbon fenestration of the upper floors and extensive use of interior glass partitions creates a feeling of spaciousness and a pleasant working environment.

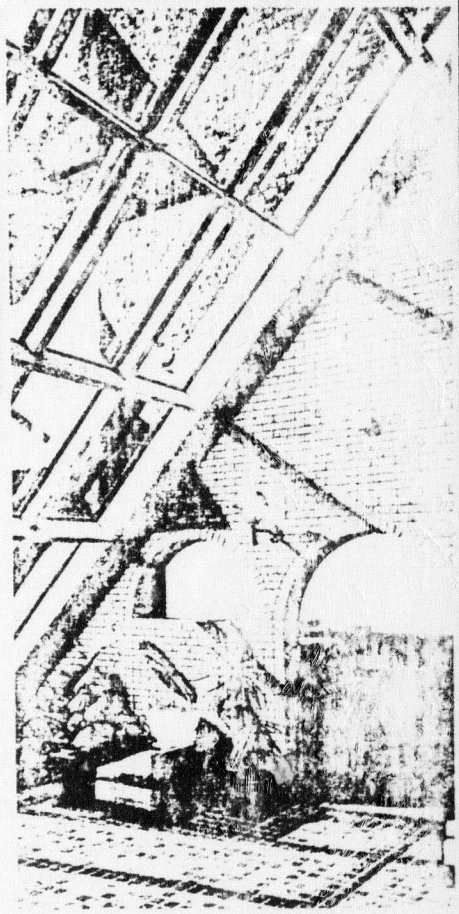
In addition to large areas of natural brick, the interior features earth-tone colorings with rust carpet and doors and white walls and ceilings. The Sanserra design in Armstrong Travertone ceiling tile, used throughout the building, offers a quality appearance and contributes toward the feeling of spatial unity.

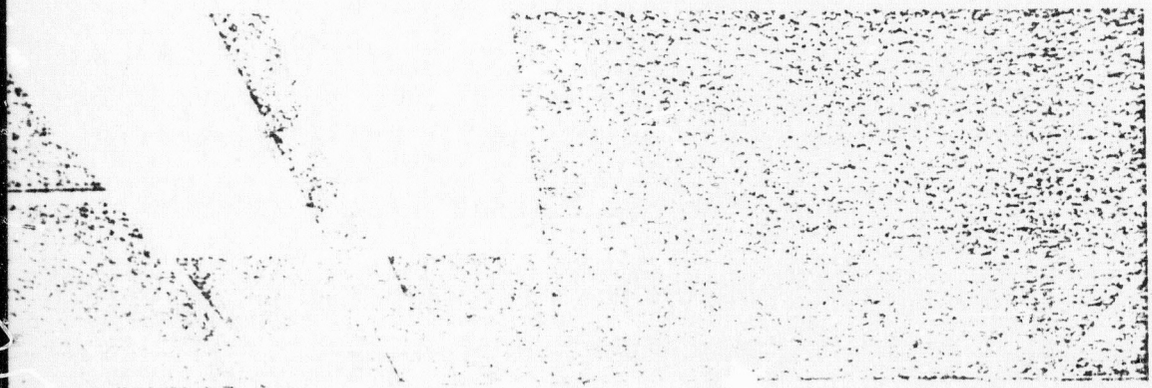
The ceiling installation was a compromise between the aesthetics of the concealed spline method and the functional practicality of lay-in grid in providing easy access to lighting and HVAC elements. For use with this semiexposed system, the Travertone tile was supplied in 12" x 48" x ¾" size. The four-foot dimension spans the space between the exposed-grid members, and the tile is supported at the long edges with concealed splines. This suspension method also supported the variable air volume units, which were easily and attractively incorporated into the ceiling.

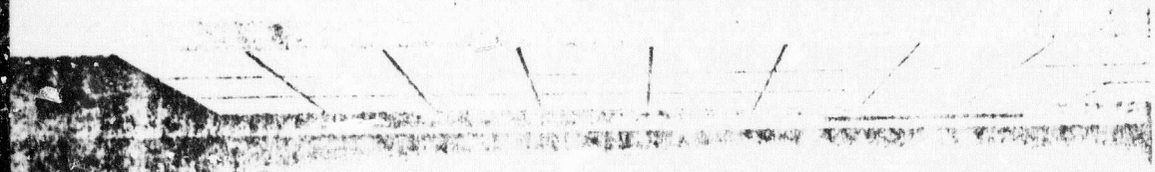
The owner of this building is a general contractor with a reputation for quality workmanship. In design and execution, his new office building is a reflection of his business philosophy.

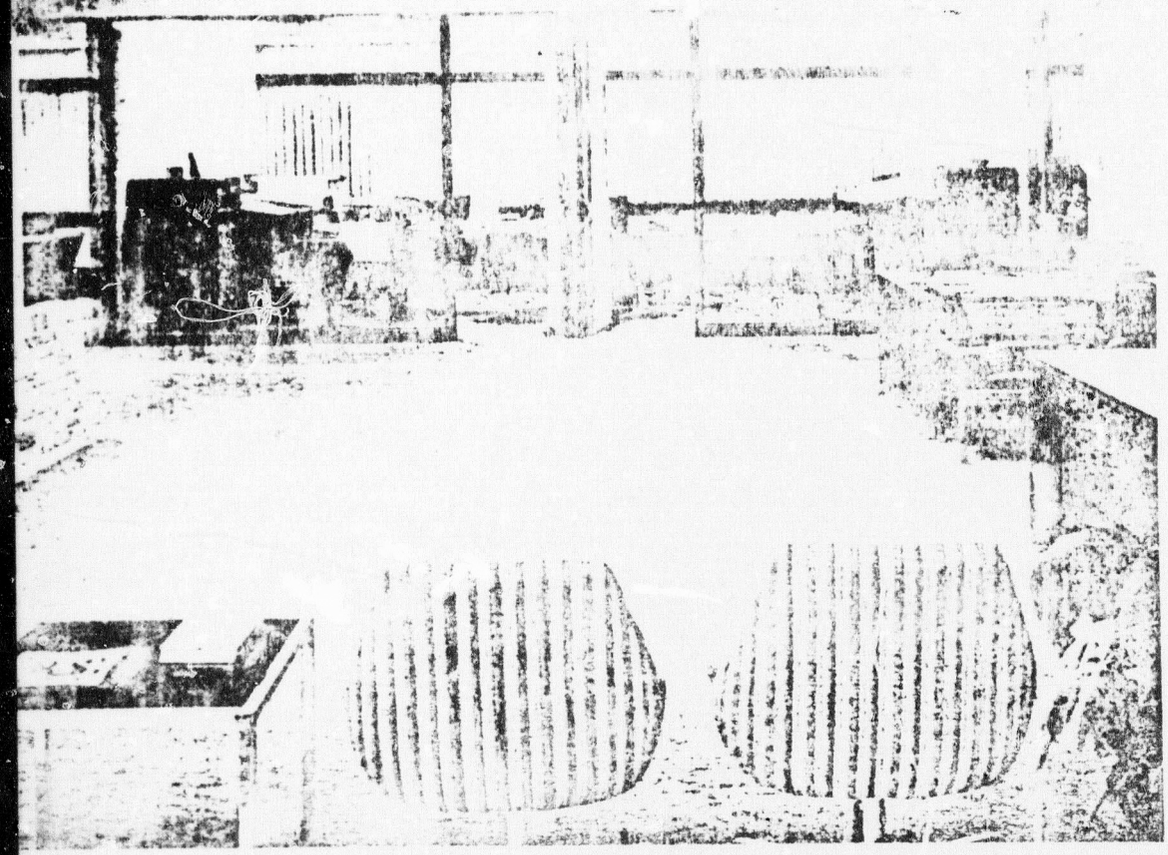












DANIEL J. KEATING COMPANY OFFICE BUILDING/ Villanova, Pennsylvania

Architects: Nauta-Diehl Associates, Rosemont

Design Architect: Gregory C. Cooke

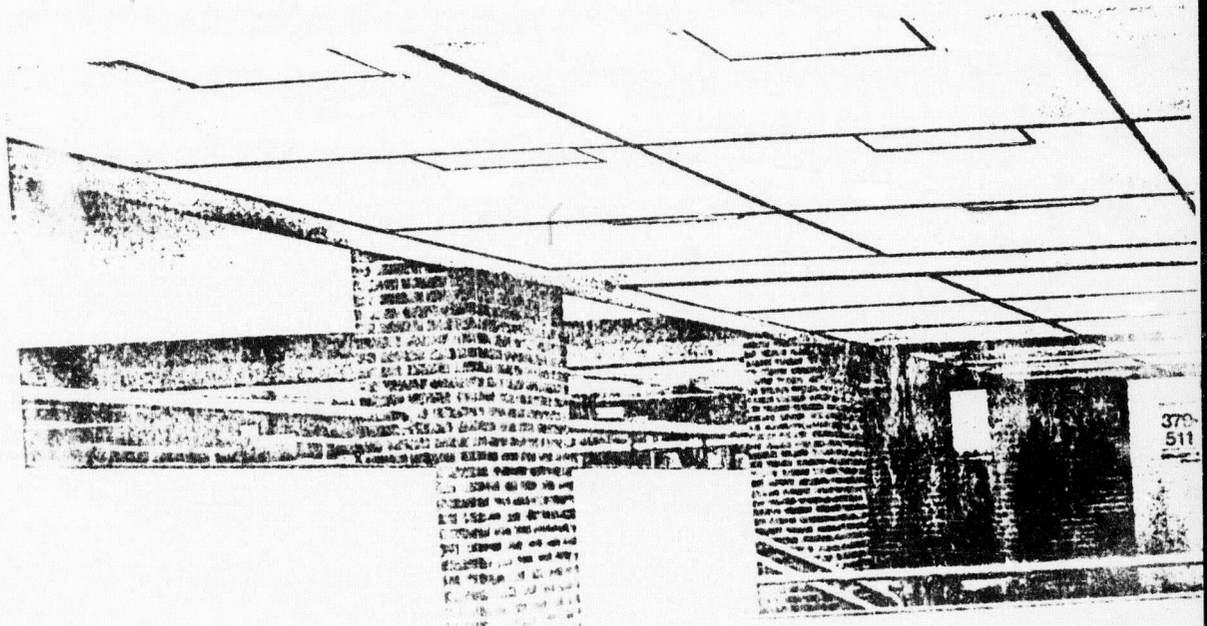
General Contractor: Daniel J. Keating Company, Villanova

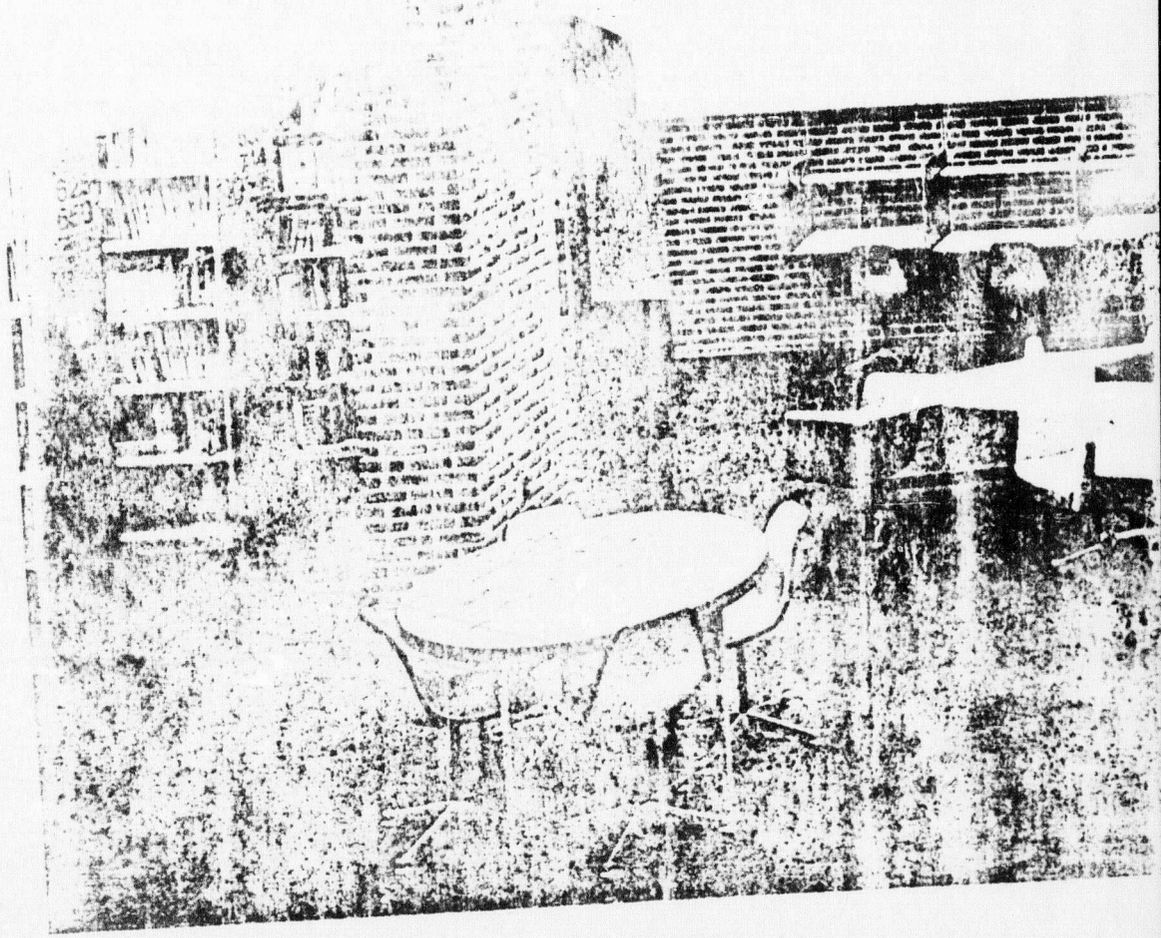
Mechanical Engineer: Peabody and Wind Engineering Company, Philadelphia

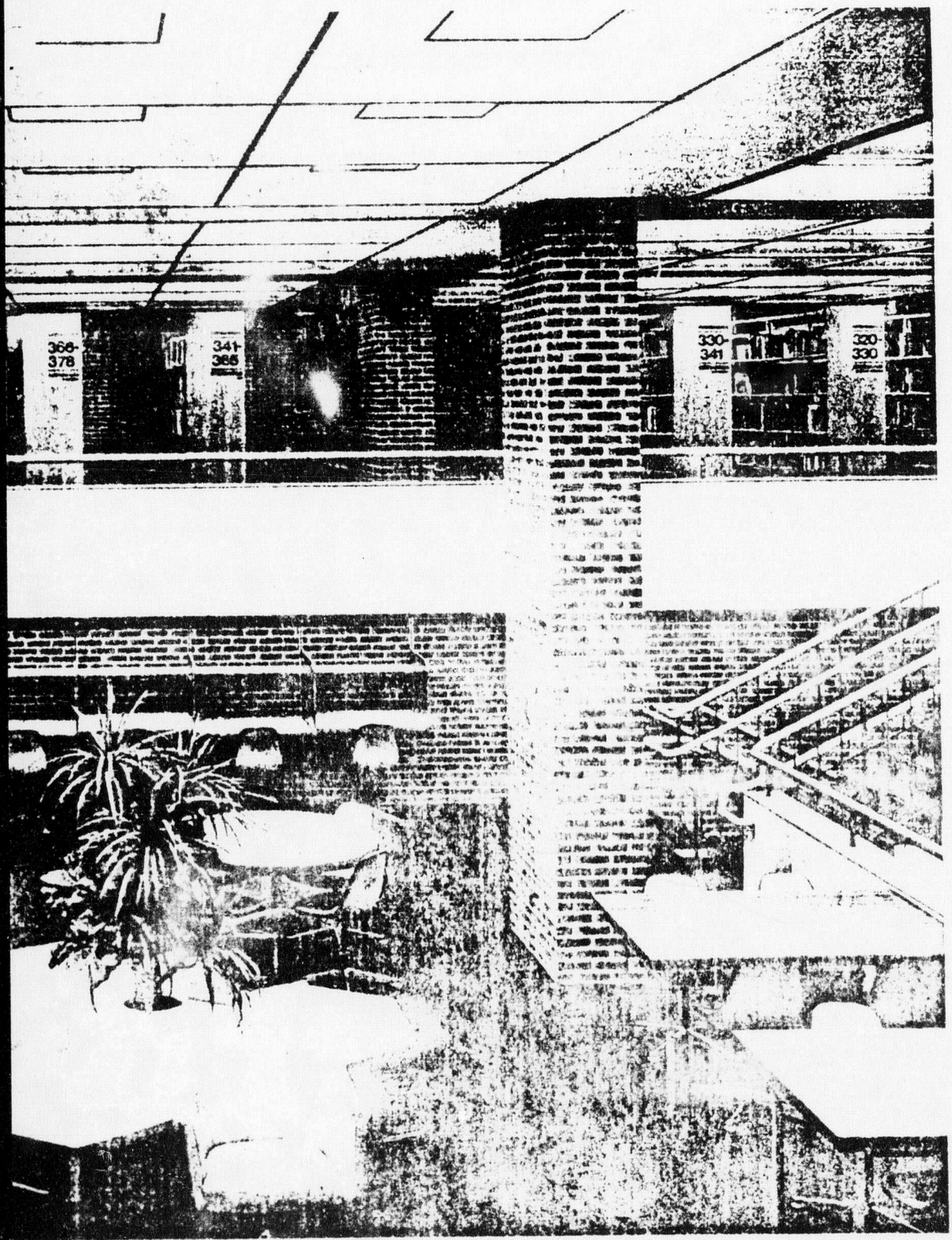
Electrical Engineer: Francis X. Bonnes, Ridley Park

Structural Engineer: James T. Smith, Upper Darby

Ceiling Systems Contractor: Berger Acoustical Co., Inc., Berwyn





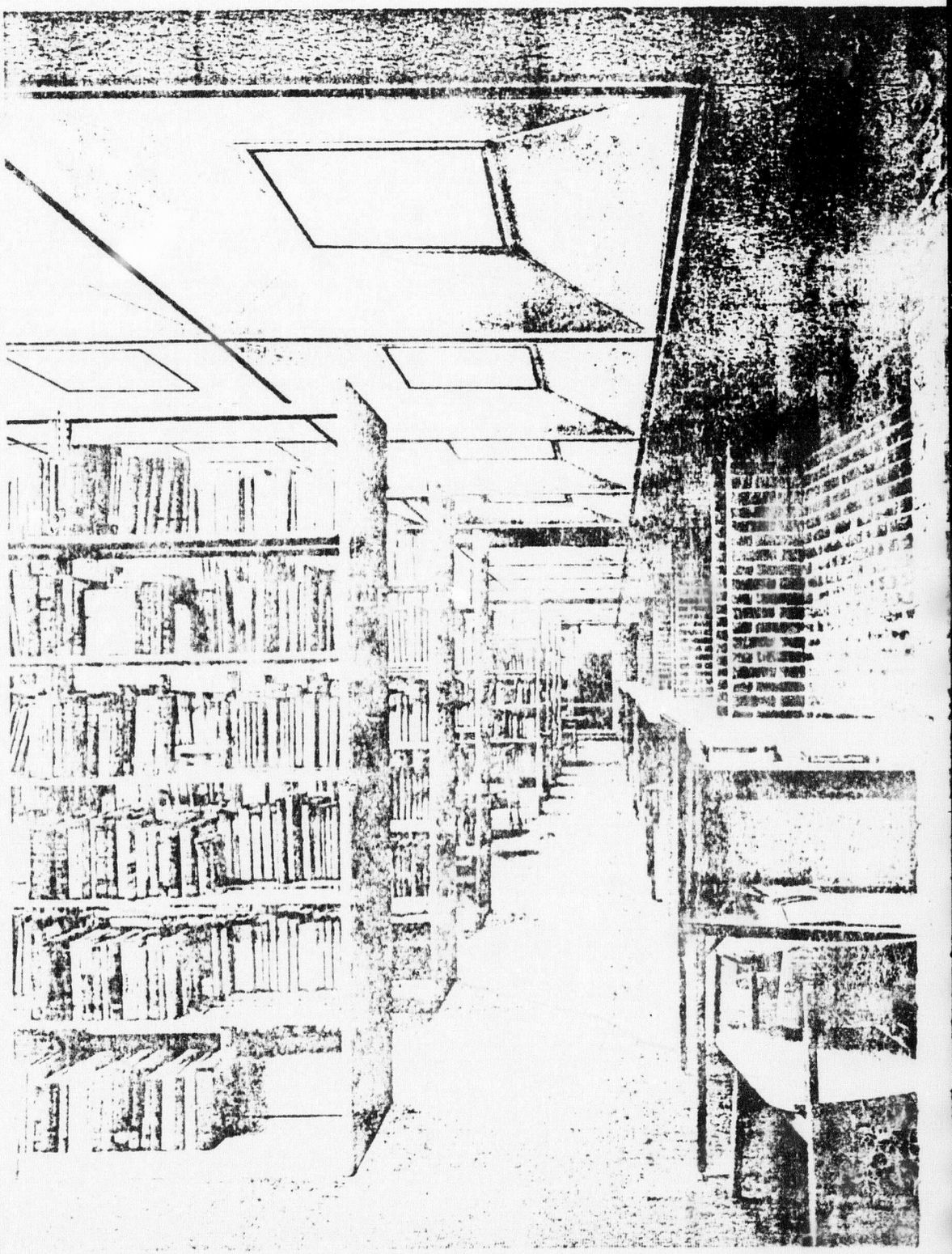


THE EMORY W. MORRIS LEARNING CENTER, KELLOGG COMMUNITY COLLEGE/ Battle Creek, Michigan

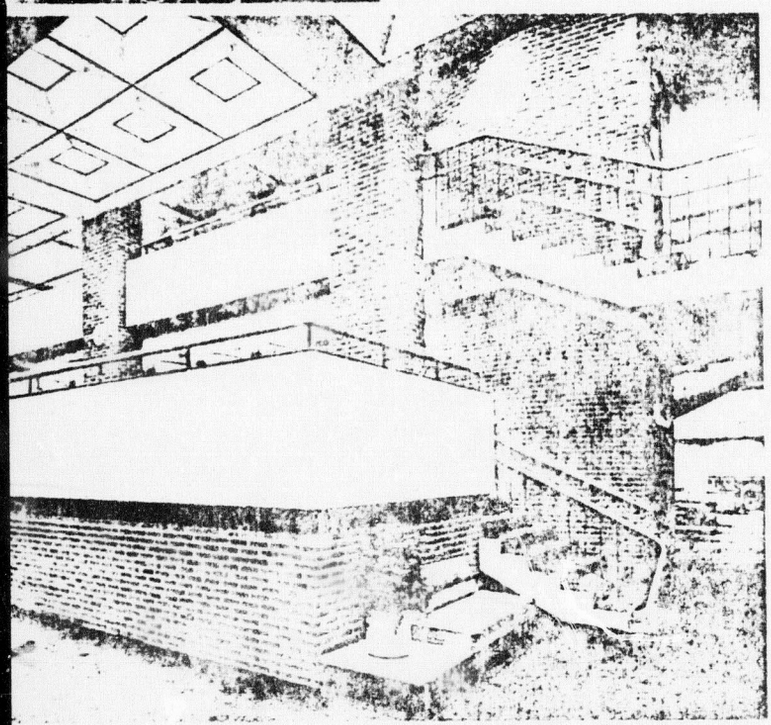
Architects/ Engineers: Sarvis Associates, Inc., Battle Creek

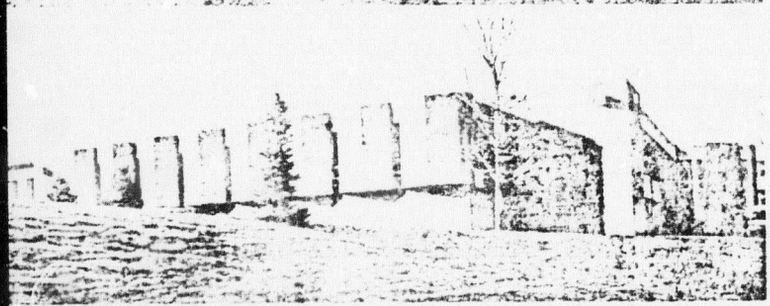
General Contractor: G. O. Lewis Company, Battle Creek

Ceiling Systems Contractor: B. C. Schuemann Company, Battle Creek









The Emory W. Morris Learning Resource Center at Kellogg Community College is a well-planned integration of an existing building with a new addition. To the existing one-story structure, comprising 12,800 square feet of floor space, a 26,300-square-foot addition was extended down a hillside to become a two-level building at the end opposite the point of attachment.

The existing building is the focal point at the end of a campus mall, and its brick, limestone, and glare-reducing glass exterior was closely matched by the materials [illegible] for the addition.

The new building's major [illegible] features a large open central core area with balconies opening from it at various levels to provide separation of functions yet maintain an atmosphere of spaciousness. The Armstrong C-60/60 Luminaire Ceiling System was selected for the core area for several key reasons. First, the architects felt that this system permitted varying levels of illumination without making the lighting obvious, and, second, the vaulted configuration picked up an inverted pyramid pattern used in the existing building.

Air distribution is handled by a high-pressure dual-duct system in the brick columns. The ducts serve mixing boxes which in turn distribute the air through the C-60/60 ceiling grid. Margins of Armstrong Minatone tile coordinated with the brick column spacing surround each nine-module area of the Luminaire ceiling. The tile ceiling here and in other rooms throughout the facility is installed on the Armstrong Accessible Tile System (ATS). This suspension system permits downward removal of any ceiling tile, thus providing total access to the plenum.

Kellogg Community College was founded in 1958, and the original section of the resource center was built in 1961. The new addition triples the size of this instructional hub of the campus and provides for greatly expanded services including a television capability, facilities for computer education, and for learning through various media including filmstrips, slides, and movies.

The learning center has stack areas for 50,000 volumes, reading areas for small and large groups, and ample viewing space for student use.

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To meet the client's request for a distinctive appearance, and faced with the space limitations of a small site, the architects for the Topeka Savings Association designed the circular building shown at right, then placed it as close as possible to the property lines along two boundaries. The confining effect of the crowded site was minimized by the curved lobby wall and by inclusion of the area between the sidewalks and streets in the landscape plan.

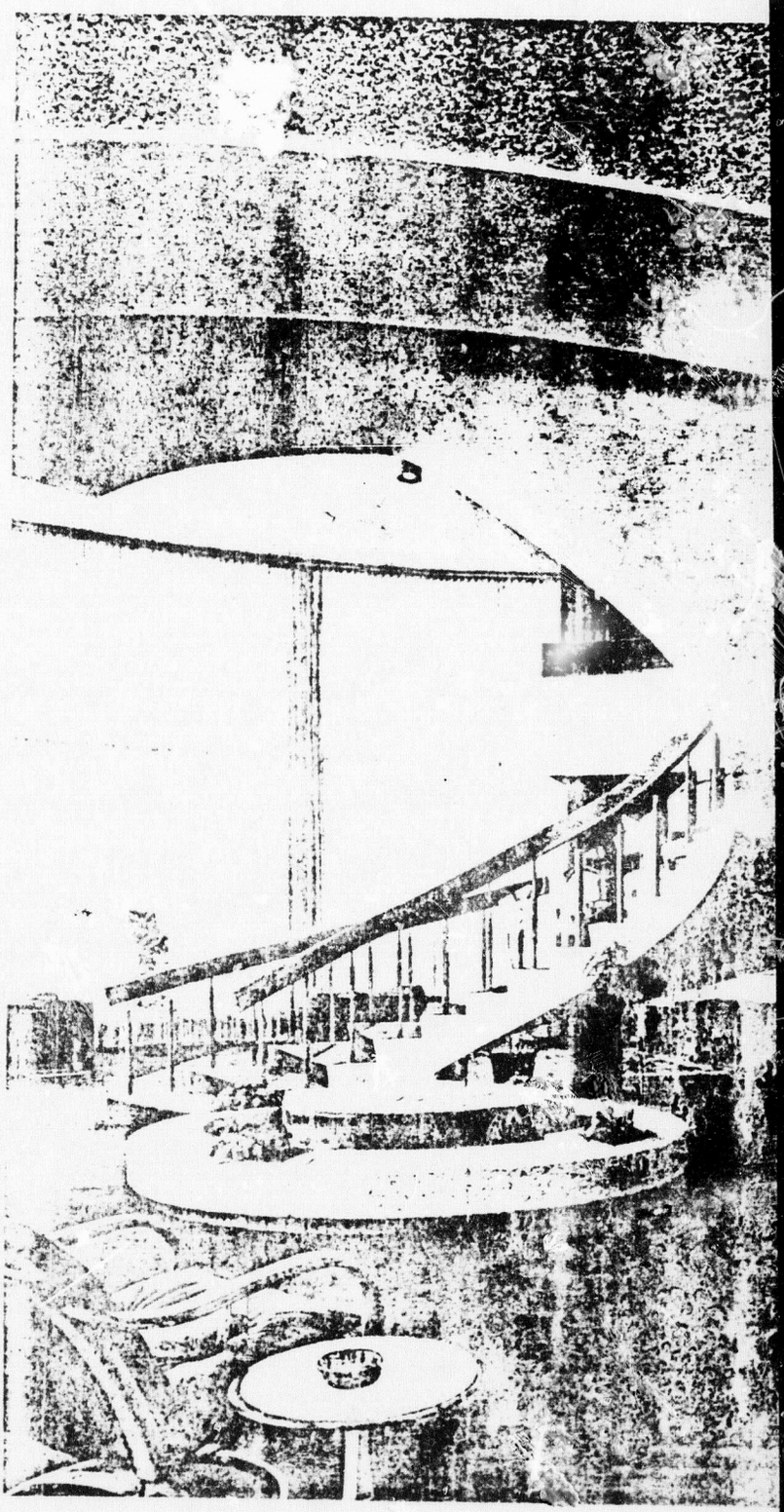
The building contains a full basement divided into a public meeting room, employees' lounge, and service areas. The two-level main-building space contains a large lobby and customer facilities at ground level and a mezzanine where executive offices, boardroom, and mortgage department are located.

The lobby is dominated by a gracefully curved stairway which ascends to the mezzanine directly under a domed ceiling section. The circular dome, the stair opening with its curved railing, and the curving stairway all provide strong and well-coordinated visual relationships of interior space to exterior wall boundaries.

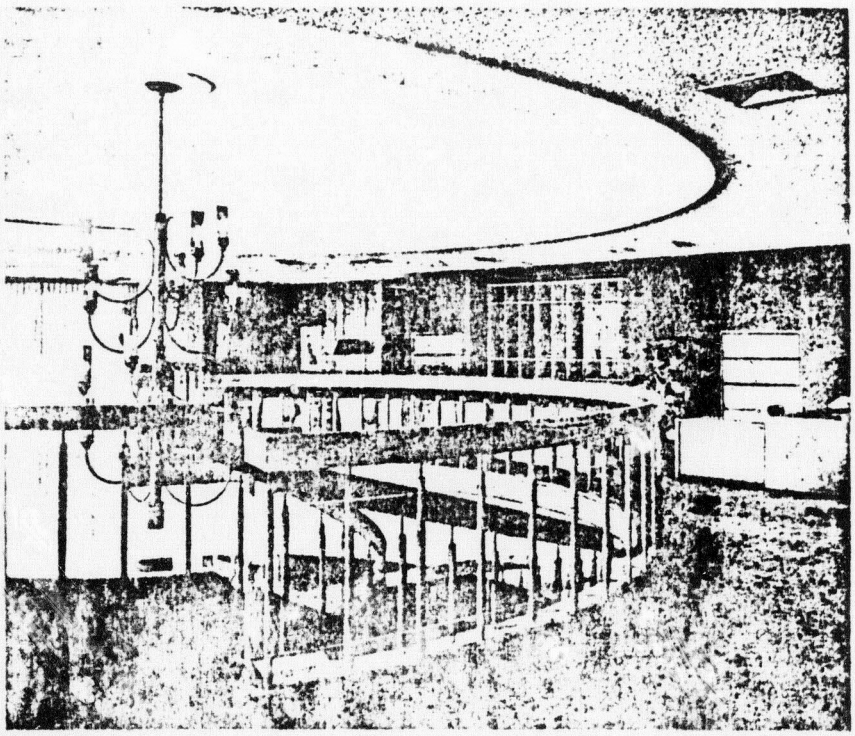
By using one ceiling material for all the open public areas, a visual harmony was maintained between the spaces under the mezzanine and those above it. The ceiling chosen was Armstrong Travertone in the luxurious deeply embossed Sanserra design. The impressive image of this exclusive design, plus its excellent acoustical performance properties, has made it a favorite for buildings where quality appearance is a key requirement.

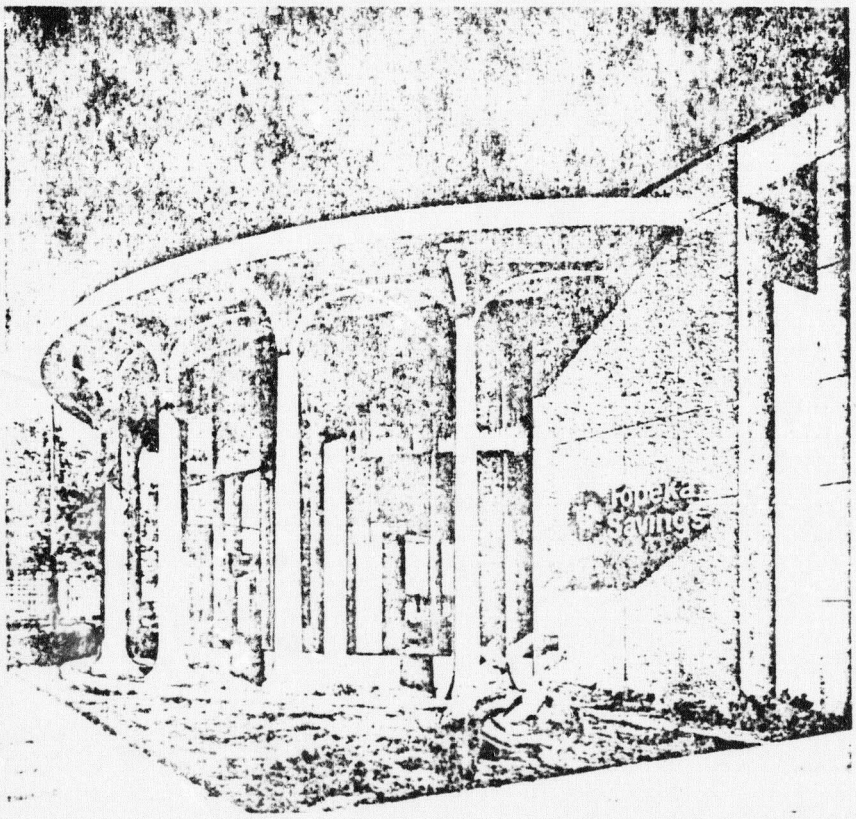
Executive offices and the boardroom also feature Sanserra ceilings. In lounge and service areas, economical Armstrong Minnboard panels were installed.

The structural system for the Topeka Savings Association building is reinforced concrete with a veneer of aggregate-finished precast concrete panels. The domed roof is framed with structural steel. Sidewall insulation is foamed urethane. The distinctive appearance of this building not only met the client's request for a strong contrast with other downtown Topeka buildings but also won the local award for the most beautiful building completed and occupied in 1973.









TOPEKA SAVINGS ASSOCIATION/ Topeka, Kansas

Architects: Eicholtz & Groth, Topeka

General Contractor: Casson Construction Co., Inc., Topeka

Mechanical/Electrical Engineers: Burgess-Latimer & Miller, Topeka

Electrical Contractor: O.K. Johnson Electric, Inc.

Ceiling Systems Contractor. Halsey-Tevis, Inc., Topeka

UNITED BANK OF CHATTANOOGA

Chattanooga, Tennessee

ST. ELMO AND BRAINERD VILLAGE BRANCHES

Architects: Planning Associates, Inc., Chattanooga

General Contractor: T & C Construction Co., Chattanooga

Mechanical Engineer: George S. Campbell & Associates, Chattanooga (St. Elmo) Armando Basarrate, Chattanooga (Brainerd Village)

Electrical Engineer: Vreeland & Associates, Knoxville

Ceiling Systems Contractor: Logan-Moore, Inc., Chattanooga

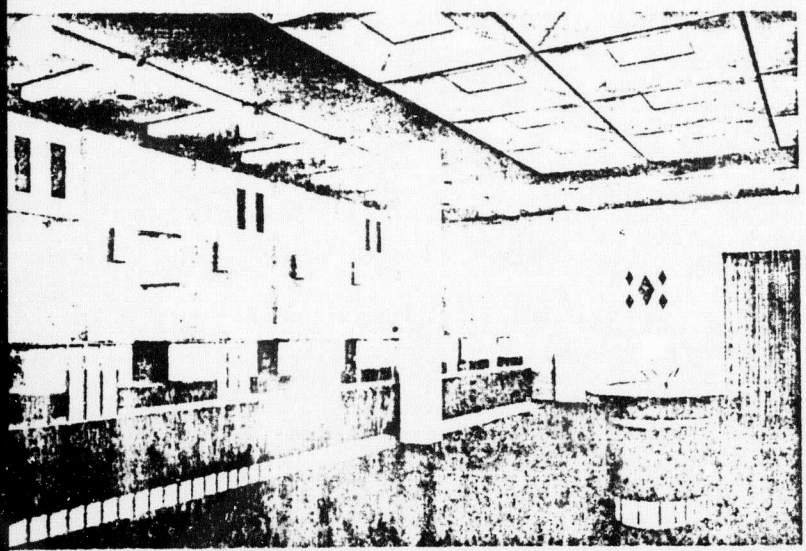
NORTHGATE BRANCH

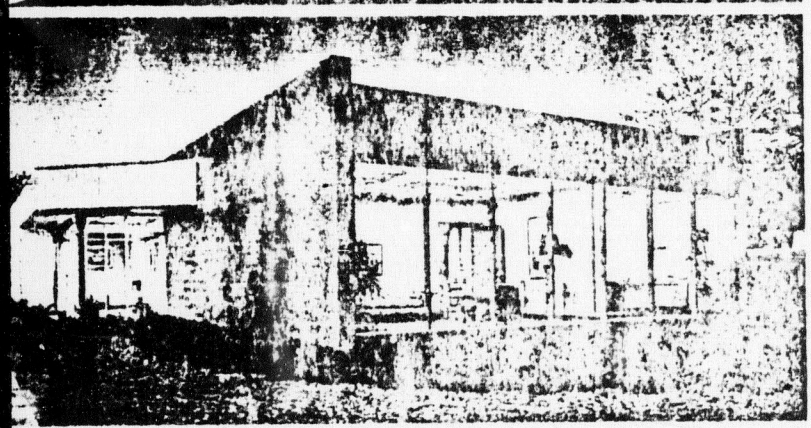
Architects and Engineers: Wamp and Wallace, Chattanooga

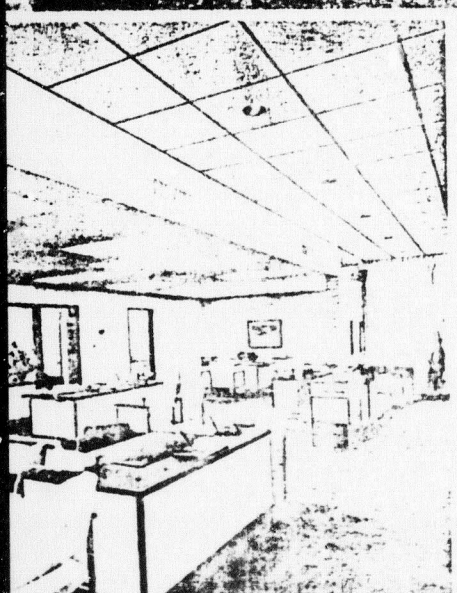
General Contractor: Syd Lang, Chattanooga

Ceiling Systems Contractor: Logan-Moore, Inc., Chattanooga









The United Bank of Chattanooga opened its doors in 1971. Today, this fast-growing and strongly customer-oriented banking organization does business from its original downtown facility and from five suburban branch locations. In the branch banks, a company policy of designing each new location individually with emphasis on cheerful, bright atmosphere and decoration has produced interiors that differ uniquely from each other but have a "member-of-the-family" look. Imaginatively chosen ceilings exemplify the individual approach to the branch bank interiors. In the St. Elmo Branch, shown in the large photograph on the left-hand page, a rough-textured Armstrong ceiling called Boldface in 24" x 24" tegular-edged panels was installed in a black grid system. Boldface has a bright white finish and when installed in tegular form on black grid tends to enhance the crisp, fresh look of the entire facility. Three skylights, each six feet square, are located over the check writing areas and provide natural lighting to supplement the fluorescent fixtures and incandescent downlighting.

At the bank's Northgate Branch, shown at the top of this page, the architect selected the Armstrong C-60/60 Luminaire Ceiling System for the lobby and surrounded it with 12" x 12" Sanserra Travertone tile. The vaulted C-60/60 ceiling was chosen to create a feeling of spaciousness and provide a dramatic focal point to direct customers to the teller stations. Vaulted C-60/60 modules in a field of Sanserra tile also were installed in private offices and the conference room.

The Brainerd Village Branch, pictured at the bottom of the page, features a ceiling of tegular-edged 24" x 24" lay-in panels in the deeply embossed Sanserra design, set off in a matte black grid system. This ceiling, like the others used in the branch banks, becomes a strong element in the interior styling of the space.

These three banks were done at relatively modest costs, yet they have succeeded in reflecting the United Bank's desire to provide its customers with a bright and friendly business atmosphere. United Bank is owned by 1,200 stockholders and is said to be the fastest growing bank in Tennessee.

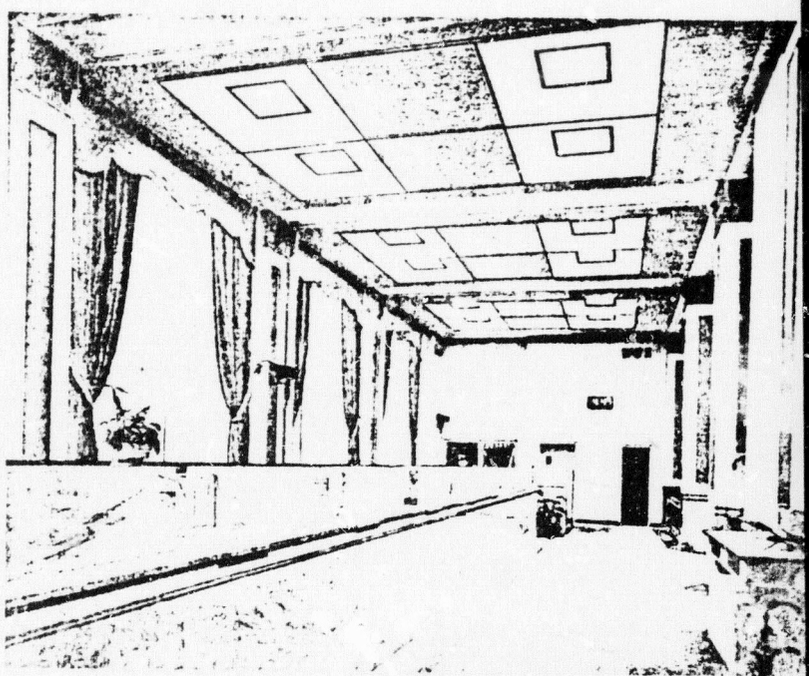
The First National Bank Building has stood for more than 70 years in the downtown section of the storied Southern city of Vicksburg, Mississippi. Through those years, the high-ceilinged banking lobby on the first floor has seen occasional change—the gaslights were replaced with incandesc fixtures, the high barred windows at the teller's stations were done away with, some furniture was updated from time to time—but the old order changed slowly.

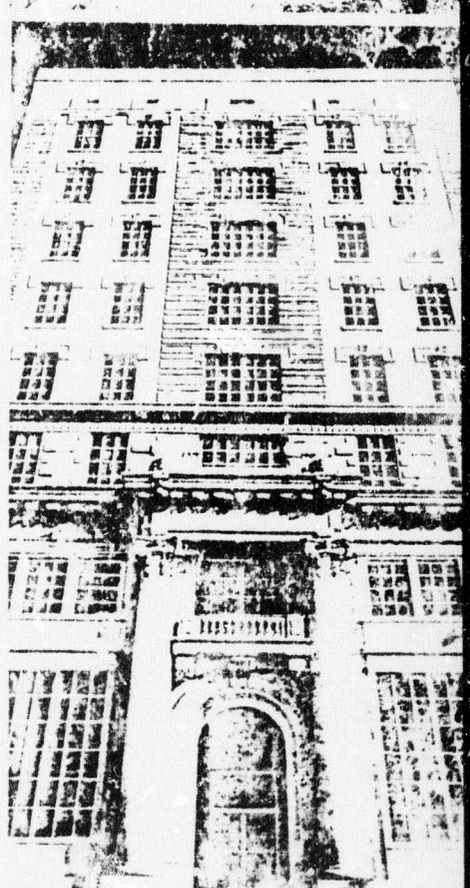
Then, in 1974, the bank officials decided that the dim drabness of the bank's interior needed a major lift. But in the true tradition of the deep South, they wanted to hold to the dignity of the past while adding warmth and brightness to the space. The successful achievement of those objectives is shown here.

The remodeling project encompassed no major structural alterations. The marble tellers' floors and wainscoting around the columns remained. The marble floors were carpeted, and new railings were placed around floor office areas. The rich red of new drapes and valances was duplicated in fabric panels mounted on the columns. But the move that had the greatest impact on the project was the new ceiling/lighting system.

In rectangular vaults in the old ceiling, which extended about [illegible] feet above the lower plastered beam surfaces, a ceiling system of Armstrong C-60/60 Luminaire modules was suspended in a field of Sanserra Travertone tile. In each vaulted C-60/60 module, a 2' x 2' Westinghouse fixture with a 400-watt mercury-vapor lamp was installed. The results were spectacular: with the lighting level moving from 20 footcandles to a new 100 [illegible] and a warm atmosphere similar to incandescent lighting achieved. Not only was lighting improved, but lamp maintenance was reduced. The 24,000-hour life of the high-intensity discharge lamp makes replacement at the twenty-foot high-fixture level infrequent.

Like most banks, the First National of Vicksburg has expanded and now operates four branches in outlying areas. But there still remains a great pride in the old downtown main banking facility which has been expressed simply and effectively in this interior remodeling effort.







THE FIRST NATIONAL BANK/Vicksburg, Mississippi

Interior Designer: O. A. Wells, Jackson

Ceiling Systems Contractor: Nicholas Acoustics & Specialty Company, Jackson

Acoustically efficient wall panels

To meet requirements for a wall material with true acoustical efficiency, Armstrong has developed Soundsoak Wall Panels*. The 30"-wide 9'-long units absorb 60% of the sound that strikes their surfaces. They comprise 5/8"-thick mineral fiber board covered with a soft modacrylic fabric in a selection of twelve natural and accent colors. For new descriptive booklet, mail us the postcard inside the back cover of TONE.



*Covered by U.S. Patent Nos. 3,920,871 and 3,921,040 (embossed)

ARMSTRONG CORK COMPANY, Park 80 Plaza West—One, Garden State Parkway at Interstate 80, Saddle Brook, New Jersey 07662 • Telephone: 201/843-0300

A & M Contracting Company, Inc.
East Hanover, NJ 07936

Acme Acoustical Corp.
Syracuse, NY 13206

Acoustical Products
Van Buren, ME 04785

American Application Systems, Inc.
Middletown, NY 10940

Arcon Systems, Inc.
Tonawanda, NY 14150

Associated Ceiling Company, Inc.
Great Neck, NY 11021

The Bader Company, Inc.
Burlington, VT 05401

Blanchard Products, Inc.
Yarmouth, ME 04096

Boxhorn Acoustical Tile Corporation
Lancaster, NY 14086

C. T. Davidson & Associates, Inc.
Albany, NY 12205

Carey Lathing & Acoustical Corporation
Rochester, NY 14607

H. Carr & Sons, Inc.
Providence, RI 02905

The Cheviot Corporation
Needham Heights, MA 02194

Circle Industries Corporation
Bronx, NY 10466

Claremont Wall Systems, Inc.
Bernardsville, NJ 07924

Conn Acoustics
Elmwood, CT 06110

Cotter Acoustics
Stamford, CT 06902

E. W. Davis and Company, Inc.
Buffalo Heights, NY 14043

Davis Acoustical Corporation
Troy, NY 12180

Davis Fetco Acoustical Corporation
Syracuse, NY 13205

Davis Fetco & Co., Inc.
Buffalo, NY 14224

Dimadison Acoustics Consultants, Inc.
Bethpage, NY 11714

Erie Acoustical Corporation
Erie, PA 16502

Franck Acoustics
Brewer, ME 04412

Hudson Valley Acoustical & Plastering Co., Inc.
Poughkeepsie, NY 12601

Island Acoustics, Inc.
St. James, NY 11780

Jacobson & Company, Inc.
Elizabeth, NJ 07201

Jacobson & Company, Inc.
New York, NY 10010

Jamestown Floor Acoustical Corporation
Jamestown, NY 14701

Johnson Acoustics, Inc.
West Springfield, MA 01089

K & H Contractors, Inc.
Braintree, MA 02184

Kessell & Morse Company
Worcester, MA 01603

Muncini Klimchuck Company
Endicott, NY 13760

C. J. Milograno Contractor Service, Inc.
Utica, NY 13501

J. L. Morin Company
Westbrook, ME 04092

National Acoustics, Inc.
New York, NY 10018

James A. Phillips, Inc.
New York, NY 10020

Pitcher Associates, Inc.
Derry, NH 03038

John C. Pratt Company
Union, NH 03887

Harry Rich Affiliates, Inc.
Union, NJ 07083

Right Finishing Company
Monticello, NY 12701

Rochester Acoustical Corporation
Rochester, NY 13624

Rochester Davis Fetco Corporation
Rochester, NY 14611

William J. Scully, Acoustics Corporation
Long Island City, NY 11101

Stokin Acoustics, Inc.
Paterson, NJ 07503

Theodore Stay and Sons
Plattsburgh, NY 12901

Superior Acoustics, Inc.
Long Island City, NY 11106

Thermal Acoustics, Inc.
West Haven, CT 06516

Westchester Acoustics, Ltd.
Mount Vernon, NY 10550

Exhibit E Annexed to Affidavit of John D. Jacobson
Letter to Martin J. Brennan from James M. Goodwillie,
Dated March 28, 1968

266 a

Armstrong
CORK COMPANY
incorporated

60 WEST FORTY-NINTH STREET
ROCKEFELLER CENTER
NEW YORK, N. Y. 10020
AREA CODE 212/582-3700

March 28, 1968

Mr. Martin J. Brennan
Jacobson & Company, Inc.
104 East 25 Street
New York, New York (10010)

CONFIDENTIAL

Dear Mr. Brennan:

On March 4, 1968 you wrote us proposing an alliance between your Company and Armstrong involving your several operations. As you know, we have had several meetings since that time to discuss various aspects of that proposal. In addition, we have thoroughly reassessed our position in light of your requests.

Long Island Area - Nassau and Suffolk Counties

In this area we would agree to your being our sole distributor, assuming a mutually exclusive arrangement. We would expect to be your sole major supplier in this area, an arrangement similar to our current exclusive situation.

Westchester - Fairfield Counties and
Five Counties of New York City

In these areas we would agree to dual distribution. We could not exclude our present representation in either Westchester or Fairfield County. We would have no justification for an exclusive arrangement since none of the three contractors involved are actually based in either of these counties. While we would not expect to be an exclusive supplier, we would expect to replace product lines where we could supply equal or superior products.

Northern New Jersey - Rockland County

With reference to your Elizabeth operation, we would agree to dual distribution and we include Rockland County since you consider it a part of this operation. Our area of jurisdiction coincides with yours except for that portion of Mercer County serviced by your Elizabeth office. Since you service the major metropolitan area of that county (Trenton) from your Philadelphia office, there should be no basic conflict. Again, we would expect the same consideration with respect to other suppliers as in the case of New York City.

With respect to the Philadelphia area, we can only refer you to Mr. Sampson's remarks during our recent meeting. The unavailability of the territory at the moment does not close the door to possible consideration at some time in the future. We would, however, expect complete respect of our Philadelphia office's current position on the matter.

We envision one problem with respect to your joint New York - New Jersey warehousing facility at Elizabeth. This warehouse services areas assigned as the responsibility of four different Armstrong salesmen: New York City, New Jersey, Westchester-Rockland and Fairfield. Since sales credit is of significant importance to these men, and to our Company in evaluating their performance, we would ask that a system be devised to enable you to give us a breakdown of your warehouse shipments to these areas. Direct shipments would pose no problem, but it would be important to us to get an accurate breakdown on materials shipped by us to your Elizabeth warehouse.

If we can agree on the areas and proposals out-lined above, we believe we are in a position to discuss positive and immediate action. We would appreciate hearing from you further at your earliest convenience and would hope to conclude negotiations prior to your departure on your extended trip.

Very truly yours,

J.M. Goodwillie
District Manager

PAT

J.O. Sampson, Building Products Division, Lancaster
J.K. Rankin, Building Products Division, New York

Exhibit F Annexed to Affidavit of John D. Jacobson

Letter to Ivan C. Park, Jr. from J. E. Snyder,
Dated January 14, 1971

Armstrong
CORK COMPANY

RECEIVED
JAN 19 1971
JACOBSON & CO., INC.
PHILA.

268 a

EXECUTIVE MALL BUILDING #6
676 SWEDESFORD ROAD
WAYNE, PA. 19087
AREA CODE 215/687-3020

January 14, 1971

Mr. Ivan C. Park, Jr.
Jacobson & Company, Inc.
230 Vine Street
Philadelphia, Pa. 19106

Dear Mr. Park:

We hasten to correct an apparent misunderstanding about the Armstrong-Jacobson relationship at Philadelphia as conveyed in your letter of January 12 to Walter Koenig.

This office has not established Jacobson & Company at Philadelphia as an approved Armstrong Ceiling Systems Contractor. On March 4 of last year, Jim Sampson and I had a long meeting with John Jacobson at which time there were no commitments made that such a relationship would be established. We did agree to review the situation from time to time to see if there were to be any changes in our Philadelphia distribution picture. As of this date, no such changes are contemplated in the near future.

We very much regret if there were any implied or assumed commitments in this respect.

Very truly yours,

J. E. Snyder

J. E. Snyder, District Manager
Building Products Division

AAF

Copy to J. O. Sampson

Exhibit G Annexed to Affidavit of John D. Jacobson

Letter to J. O. Sampson from John D. Jacobson, Dated January 26, 1971

January 26, 1971

Mr. J. O. Sampson, Manager
Architectural Sales
Building Products Division
Armstrong Cork Company
Lancaster, Pa. 17604

Dear Jim:

Needless to say I was quite surprised to receive Jake Snyder's letter of January 14th. As you know, I have been selling Armstrong materials in the Philadelphia market since August 1, 1970. However, in deference to your request, I have not bid on the large projects on which Armstrong materials were specified until January 1, 1971 - as per our agreement.

I have told our sales personnel in the Philadelphia office to bid on all jobs using Armstrong.

Jim, I expect to receive support from your local sales operation in the Philadelphia market. I assume that this is your intention also. Accordingly I suggest that you and Jake Snyder contact Van Park to set up preliminary meetings at the management level followed by meetings with our respective sales departments.

Regards,

John D. Jacobson
President

JDJ:mo

CC: Mr. J. E. Snyder

BC: Mr. Ivan C. Park, Jr.

Exhibit H Annexed to Affidavit of John D. Jacobson

Letter to John D. Jacobson from J. O. Sampson,
Dated February 3, 1971

270 a

Armstrong
CORK COMPANY

AREA CODE 717 | TELEPHONE 397-0611

LANCASTER, PA. 17604

February 3, 1971

Mr. John D. Jacobson, President
Jacobson & Company, Inc.
104 E. 25 Street
New York, N. Y. 10010

Dear John:

Following through on our telephone conversation of last week, I again discussed with Jake Snyder our situation in the Philadelphia market.

Jake is distressed, as I am, that you had been led to believe that his office would be prepared to work closely with your Philadelphia branch starting in 1971. If you gained this impression from me, I can only apologize for misleading you. You did point out last summer that it would be impractical to carry two manufacturer's stocks at Elizabeth, and that you would be shipping Armstrong material for remodel jobs into the Philadelphia market.

We agreed that it would not be practical to service all of your jobs from Elizabeth and that you would need factory shipments to job sites to operate efficiently. I did ask that you delay any shipments from our factories into Philadelphia until after January 1, 1971 as this would be upsetting to our long standing relations with Berger.

Jake recognizes your problems with a centralized warehouse at Elizabeth and your right to order Armstrong material for shipment into his territory when this is to your advantage. Legally, we can't prevent this, but frankly, we would prefer that you do not promote or sell our materials in that market.

Looking strictly at our Philadelphia territory, we still do not feel it would be fair to Berger to service your Philadelphia office from our Philadelphia office. We have operated with Berger as our sole distributor in the Philadelphia market for over 20 years. During that period, Berger has consistently increased their sales of our products, and their performance last year was exceptionally good.

With this long relationship, our Philadelphia office has full access to all of the contacts, information, and objectives of the Berger group. Jake doesn't feel that his men could now work closely with your Philadelphia Representatives without violating confidences that should be respected.

I know that we have gone over all of this ground before, and I may have been unfair in the past in agreeing that there was always a chance that our

situation in Philadelphia would change. Actually, we have an even greater obligation to Berger today than when we first discussed our association with your company three years ago. Jake's position is that you have the right to promote and sell Armstrong materials in the Philadelphia market if you elect to, but he doesn't feel that he should encourage this through his office.

In developing this business, we have always felt that our district managers must be given the right to establish the distribution that they feel is best for their own territory, even if this does not mesh well with the distribution established in an adjacent territory. Our managers know they have this authority, and are free to establish programs and objectives with their customers, without concern that their decisions will be revised by our home office.

In writing to Van Park, Jake was trying to be fair and objective by indicating that he did not feel he could service your Philadelphia branch. We recognize that it will not be fully satisfactory or effective to obtain information, samples, etc., through our New York office, but this is the only arrangement we're in position to offer. I think we would be wrong to imply that there is any real chance that our position is likely to change in the foreseeable future.

I hate to write such a blunt letter, but I am anxious to be as honest as possible and prevent any further misunderstandings.

Very truly yours,

J. O. Sampson, Manager
Architectural Sales
Building Products Division

CAS

Exhibit I Annexed to Affidavit of John D. Jacobson

Letter to Richard C. Wiley from Ivan C. Park, Jr.,
Dated October 22, 1971

JACOBSON
& Company, Inc.,
Contractors
since 1889.
104 E. 25 Street,
New York, N.Y.
10010
Area 212,
677-4250.

272 a

ABOVE ALL Quality OVER 80 YEARS

October 22, 1971

Mr. Richard G. Wiley, District Manager
Architectural Sales-Building Products Division
Armstrong Cork Company
Park 80 Plaza West - One
Garden State Parkway at Interstate 80
Saddle Brook, New Jersey 07662

Re: Armstrong Representation
Philadelphia Area

Dear Dick:

As we discussed on October 20th, I would very much appreciate your working out a reasonable solution to the problem that currently exists between Armstrong and Jacobson in the Philadelphia/South Jersey area. As a good customer of Armstrong, we feel we are entitled to this service and support.

As I outlined to you, we are going to impact that Acoustical market, and I am sure your company would be interested in securing a good share of our business as a result. Therefore, a good "working relationship" should prevail between our representatives in Cherry Hill and Armstrong Cork Company in such matters as special pricing, samples and literature, defective material follow-up, etc.

After you have had a chance to meet with Jake Snyder, I would appreciate hearing on what basis we should handle our Armstrong business in that area in the future. Please know that we appreciate the assistance we have gotten thus far from both you and Joe McGinty, when required.

Best personal regards.

Sincerely yours,

Ivan C. Park, Jr.
Vice President

ICP/rk

cc: S. J. Schanzer, J. D. Jacobson, R. R. Iatesta

Exhibit J Annexed to Affidavit of John D. Jacobson

Letter to J. H. Binns from John D. Jacobson,
Dated January 17, 1972

JACOBSON
& Company, Inc.,
Contractors
since 1889.
104 E. 25 Street,
New York, N.Y.
10010
Area 212,
677-4250.

273 a

Above All Quality
Over 80 Years

January 17, 1972

Mr. J. H. Binns, President
Armstrong Cork Company
Lancaster, Pennsylvania 17604

Dear Mr. Binns:

I am taking this opportunity to write to you about a matter of great concern to us.

Jacobson & Company has been a franchised distributor of Armstrong products for the last several years in the following areas:

Office	Area
Elizabeth, New Jersey	Northern New Jersey
New York, New York	Five boroughs of Manhattan, Upstate New York, Fairfield, Connecticut
Plainview, New York	Nassau and Suffolk Counties

We have had an office covering the Philadelphia market since 1937. At the time we were franchised as an Armstrong distributor in the above three offices, we were not franchised in the Philadelphia area.

In May, 1971 we sold our Philadelphia office and warehouse and moved to Cherry Hill, New Jersey where we maintain a sales office. Purchasing and warehousing for the Cherry Hill office, which covers the Southern New Jersey and Eastern Pennsylvania market is performed by our Elizabeth, New Jersey consolidated warehousing and purchasing department.

For the purpose of simplifying our inventory, we have been selling and installing Armstrong materials in the Southern New Jersey and Eastern Pennsylvania market without the services or assistance from your Philadelphia Regional Office. As a major customer of Armstrong Cork Company, our sales personnel should receive maximum assistance from your sales offices. I have discussed this matter with Andy Armstrong and others and have had no assistance. Dick Wiley's office has provided me with information from time to time.

We recently bid a job in Pennsylvania (Penns Grove) and we asked for price and technical information from your regional office and from Lancaster direct and we were denied the

information. We were unable to bid the job on the basis of Armstrong. This puts us in a very serious competitive situation in this market.

Mr. Binns I am appealing to you for your assistance and personal review in this matter to see if there is some way that Jacobson & Company can receive equal treatment along with other Armstrong distributors in the Southern New Jersey and Eastern Pennsylvania area. Your assistance will be greatly appreciated.

Sincerely,

John D. Jacobson
President

JDJ:mo

CC: Andrew J. Armstrong
P. W. Unger
W. W. Locke
R. C. Wiley
J. E. Snyder
S. J. Schanzer
R. R. Iatesta

Exhibit K Annexed to Affidavit of John D. Jacobson

Letter to John D. Jacobson from Phillip W. Unger, Dated February 4, 1972

275 a

Armstrong
CORK COMPANY

AREA CODE 717 | TELEPHONE 397-0611

LANCASTER, PA. 17604

February 4, 1972

Mr. John D. Jacobson, President
Jacobson & Company, Inc.
104 East 25th Street
New York, NY 10010

Dear John:

Thank you for your letter of January 17 to Mr. Binns concerning the difficulty you have experienced at your Cherry Hill, New Jersey sales office. I recently assumed responsibility for this division so he personally asked me to look into this matter and respond directly to you. I apologize for the delay in writing but I did want to carefully review this matter first.

As you know, we presently have a number of other contractors in and around the Greater Philadelphia Area. Their performance in the past has been excellent and our participation in the commercial ceilings business in that market good. At the present time, we do not see the necessity to expand our current contractor distribution system there.

We certainly respect and encourage your right to sell whomever and wherever you desire. However, we staff our regional offices with enough personnel to service contractors located in that area. Dick Wiley, Joe McGinty, Dave Dombar and Bob Baram will continue to render whatever assistance your operations may require. Our Philadelphia personnel will do the same thing for our contractors there.

Please understand that we are not staffed to handle requests for specialized information concerning jobs far removed from our personnel in either office. We also feel it detrimental to our mutual interests to further expand the present responsibilities of either staff.

John, assistance to our contractors is a major premise upon which we operate. It is the reason we enjoy the success in this business that we do. We shall continue to pursue such a course of mutual benefit and goodwill. We do appreciate your bringing this matter to our attention and please feel free to contact me again if you have further questions.

Sincerely,

Phillip W. Unger
General Sales Manager
Architectural Ceiling Systems Division

BJH

Exhibit L Annexed to Affidavit of John D. Jacobson

Letter to Phillip W. Unger from John D. Jacobson,
Dated February 22, 1972

JACOBSON
& Company, Inc.,
Contractors
since 1889.
104 E. 25 Street,
New York, N.Y.
10010
Area 212,
677-4250.

276 a

ABOVE ALL Quality OVER 80 YEARS

February 22, 1972

Mr. Phillip W. Unger
General Sales Manager
Architectural Ceiling Systems Division
Armstrong Cork Company
Lancaster, Pa. 17604

Dear Phil:

Thank you for your letter of February 4th.

I regret that Armstrong is unwilling to assure us that the problems we encountered in bidding jobs for Armstrong products in the Philadelphia area were not inadvertent. In fact, it would appear from your letter that our difficulties stem from a concerted effort on Armstrong's part to inhibit us from expanding our successful promotion of Armstrong products into areas served by other Armstrong distributors.

I am glad to see that you recognize that Armstrong cannot and does not intend to restrict the area within which we can install material purchased from Armstrong. However, as you must be aware, the refusal of your sales representatives to furnish us with prices for special materials and other necessary technical assistance will, in many cases, including the Penns Grove job mentioned in my letter of January 17th to Mr. Binns and another job in which we are interested in Allentown for the Pennsylvania Power and Light Company, effectively serve to preclude us from bidding Armstrong products. The refusal to furnish us with this assistance on Philadelphia area projects is tantamount to a restriction against reselling Armstrong material we purchased from you for installation on these projects.

To furnish us with the assistance we seek certainly

will not unduly tax the representatives of your Philadelphia regional office, as you suggest, since they will presumably furnish the identical information that we seek to other Armstrong distributors who propose to submit bids for the jobs in question. Of course, by aiding some of your distributors in this fashion, Armstrong also leaves itself open to a charge that it has improperly discriminated in the services and facilities furnished to different purchasers of Armstrong products.

I trust Armstrong will reconsider its position and confirm to us that it will furnish us with the same technical services and assistance that it furnishes to other Armstrong distributors for jobs in the Philadelphia area. Of course, we would also expect that any products we may order for ultimate installation on a Philadelphia area project will be offered to us at the same prices as offered to our competitor distributors.

I would appreciate a prompt reply.

Sincerely,

JOHN D. JACOBSON
President

cc- Mr. J. H. Binns,
President

bc - Ivan C. Park, Jr.
Samuel J. Schanzer
Robert R. Iatesta

Exhibit M Annexed to Affidavit of John D. Jacobson

Letter to John D. Jacobson from Phillip W. Unger, Dated March 9, 1972

Armstrong
CORK COMPANY

278 a

PHILLIP W. UNGER
General Sales Manager
Architectural Ceiling Systems Division

LANCASTER, PA 17604

March 9, 1972

Mr. John D. Jacobson, President
Jacobson & Company, Inc.
104 East 25th Street
New York, NY 10010

Dear John:

I received your letter of February 22, and one thing is rather apparent. It is difficult to get complete understanding of one's position in a letter and I only wish we had the opportunity to discuss your questions in person. There remains some misunderstanding based on comments in your last letter that I should attempt to clarify.

First, may I say again there is absolutely no attempt being made to inhibit Jacobson, or any of our contractors, from bidding Armstrong products anywhere. Contractors handling our line often bid and install materials on projects far removed from their home office.

Now let me explain an area of our responsibility in this manufacturer-contractor relationship. Our field organization does promote Armstrong products and systems to the specifying influences in the marketplace. Once a job has been specified, it becomes the contractor's responsibility to take the job off, estimate and bid it and, if he is awarded the contract, to provide proper installation based on the plans and specifications furnished by the architect. Our men are not qualified to perform these functions and we as a Company do not accept the responsibilities involved. Some manufacturers do bid direct and provide for installation. We have chosen to distribute through approved Ceiling Systems Contractors.

You mentioned pricing. We publish prices for our products, and they are furnished to all Armstrong contractors to assist them in bidding ceiling jobs. Deviations are made from this list only to meet specific competitive situations reported by the contractor on a specific job. This has been done with Jacobson as well as with other contractors and is a common practice in the industry.

Also, our representatives are instructed to service all of our contractors' requests for prices of "special" items when requested; this is true for technical assistance, too. If you have had a problem in this area it certainly must have been inadvertent and we shall take the necessary steps for corrective action. This type of service is one of our strengths as a supplier.

Most subcontractors do not order material until the job is awarded. It is virtually impossible, and certainly impractical, to anticipate projects and order accordingly. This is particularly true for the sophisticated type of integrated ceiling job mentioned in your last letter. For this reason, and since we do not inhibit a contractor's bidding activity, I do not understand your comment that we were restricting you "against reselling Armstrong material we purchased from you for installation on these projects." There is normally at least 9 to 12 months between contract award and ceiling installation on a monumental type building, more than ample time to order and receive material.

We do not discriminate against any of our contractors. We have always attempted to answer questions raised by any and all contractors bidding on a particular project and will continue to do so. Some questions of a technical nature are submitted to Lancaster and our salesmen know whom to call for the answers. Also, our prices are the same to all of our contractors, and we will continue to respond impartially to competitive pricing of other manufacturers on jobs reported by the contractor, regardless of his location or regional office.

John, as I mentioned earlier, I would enjoy meeting with you to answer personally any questions you might have. We value our association with Jacobson, make no mistake about that. I will be out of town until March 17, but when I return let's try to get together. I will give you a call when I return.

Sincerely,

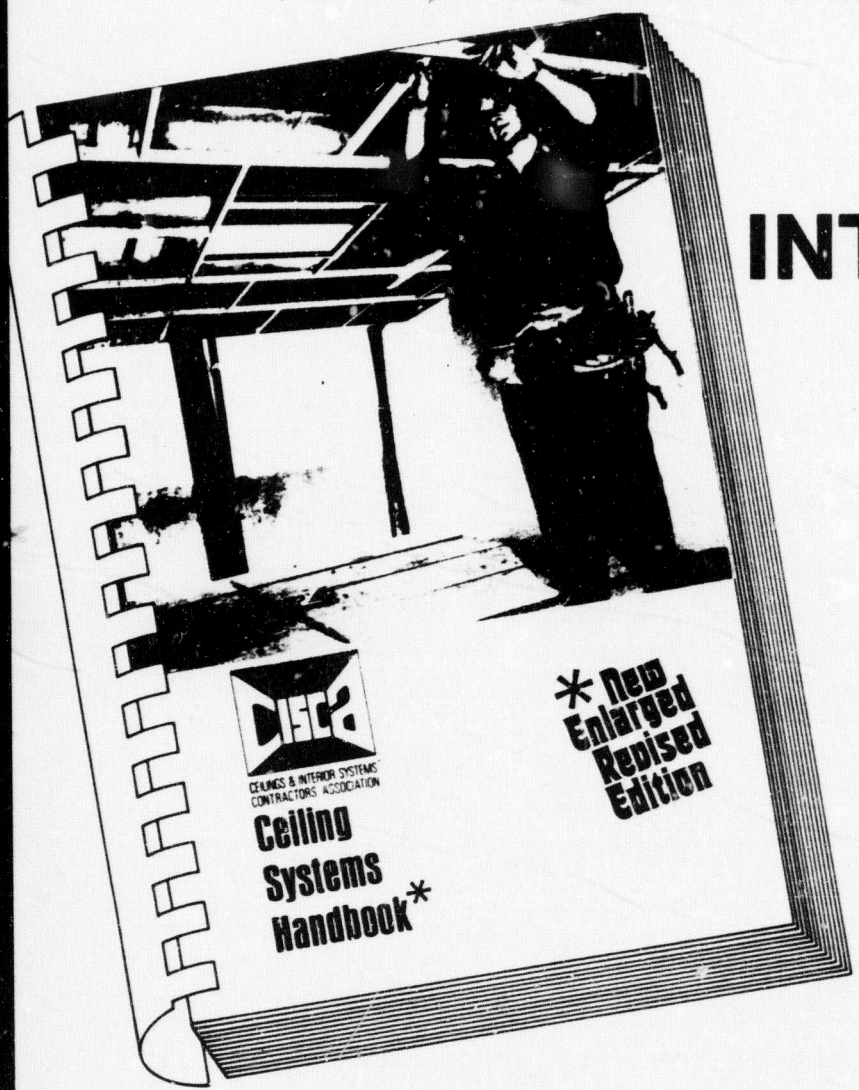
Phillip W. Unger

BJH

Exhibit N Annexed to Affidavit of John D. Jacobson

Various Flyers and Advertisements of Jacobson Supply Center

280 a



INTRODUCTORY OFFER

JACOBSON wants to introduce you to the systems and savings available from our supply center - so we are offrering this HANDBOOK (over 350 pages) developed by *The Ceilings & Interior Systems Contractrors Association* FREE with your *first* purchase from JACOBSON SUPPLY. The HANDBOOK is complete and unique and will teach you and your personnel the best methods of installing all standard ceiling systems. If you are not ready to purchase but still would like the HANDBOOK they are for sale at $5.95 each including postage and handling – and we will deduct the price from your first $100 of purchases.

Let JACOBSON help you with your acoustical and partition requirements.
Our free ADVISORY SERVICE can help you with

☐ **BUDGETS** ☐ **MATERIAL SELECTION**
☐ **ACOUSTICAL ANALYSIS** ☐ **INSTALLATION METHODS**

First Class
Permit No. 2017
Elizabeth, N. J.

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Mr. Philip A. Miller
JACOBSON SUPPLY CENTER
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Gentlemen:

☐ Please send me a copy of the Ceiling Systems HANDBOOK. Enclosed is a ☐check ☐money order for $5.95 to cover the cost (including postage and handling).

☐ Please call. We need pricing and advisory assistance and would like to take advantage of your introductory offer.

NAME _____ TITLE _____

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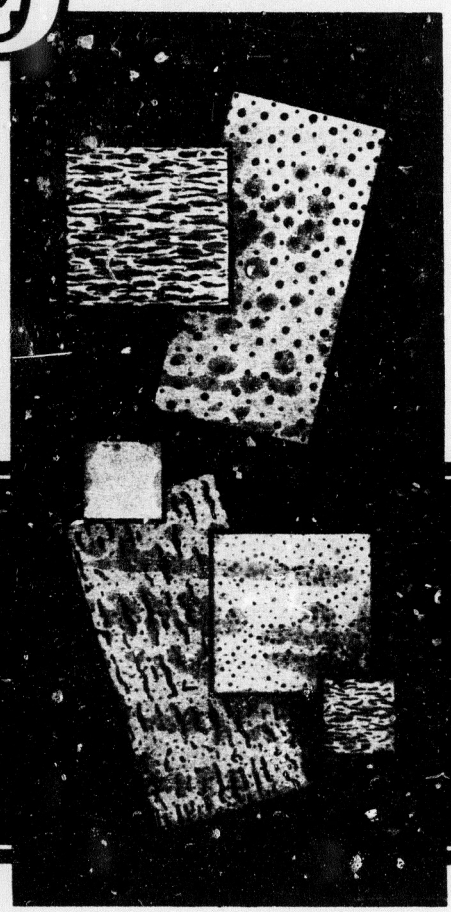
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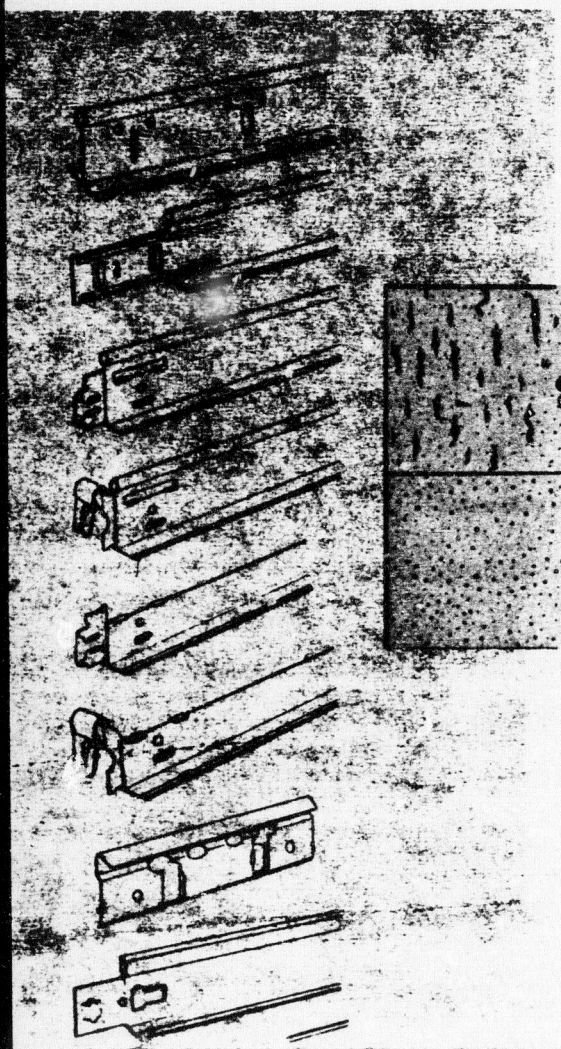
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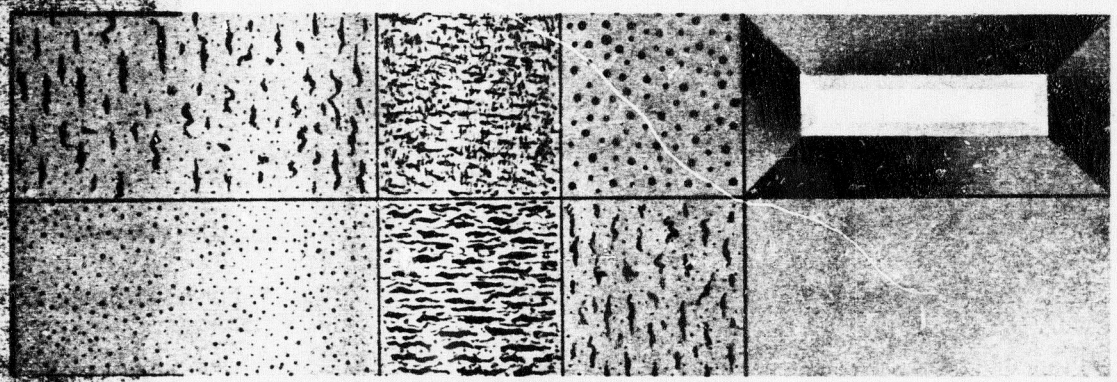
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ACOUSTICAL CEILINGS & PARTITION MATERIALS

We can help with your renovation plans . . .

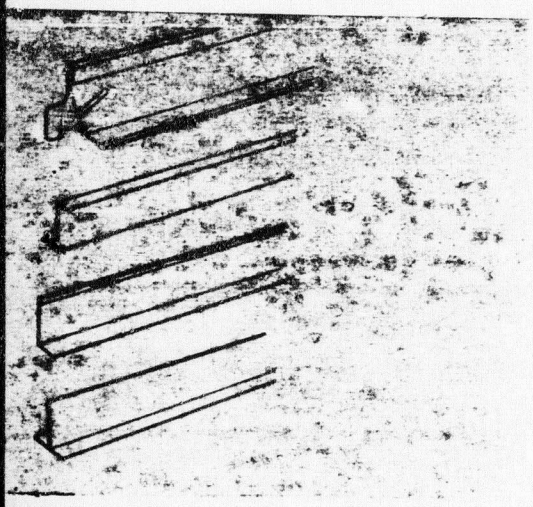




we provide assistance in

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INSTALLATION METHODS
ACOUSTICAL ANALYSIS

and



LOWEST WHOLESALE PRICES

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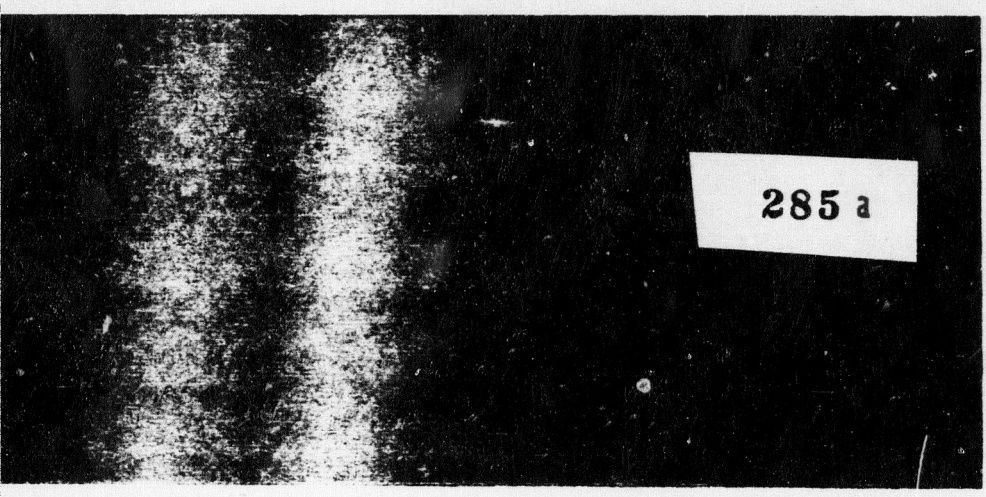
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CITY STATE ZIP PHONE

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NRM
GYM PACT

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New Jersey	**201 • 355-5200**
Pennsylvania	**215 • 567-6936**

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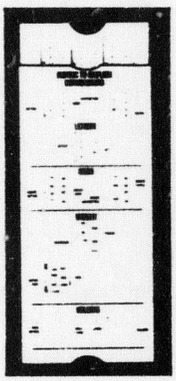
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Accoustical ceilings Flooring Partitions

Translucent lenses (for light fixtures)

Gympact (the guaranteed vandal-proof ceiling)

Remarks



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This announcement should be directed to the person who buys acoustical ceilings, flooring, partitions, fixture lenses, etc.
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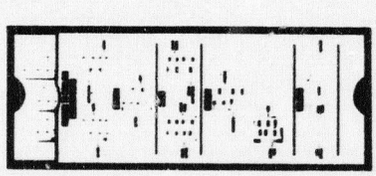
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(Continued next page)

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ALUMINUM CEIL
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explosion hazard, dirt,
wind pressure, r

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Exhibit O Annexed to Affidavit of John D. Jacobson

Letter to John D. Jacobson from Richard C. Wiley,
Dated March 19, 1976

Armstrong
CORK COMPANY

PARK 80 PLAZA WEST-ONE
SADDLE BROOK, N. J. 07662
AREA CODE 201 843-0331

March 19, 1976

Mr. John D. Jacobson
Jacobson & Company
104 East 25th Street
New York, NY 10010

REGISTERED MAIL
RETURN RECEIPT REQUESTED

Gentlemen:

For the past several years you have been distributing our line of acoustical materials. We have come to the conclusion that this relationship should be terminated. Accordingly, we are serving this notice upon you of the termination of that distributorship effective as of the date of your receipt of this letter and subject to the conditions set forth below.

We have checked our records and find that your order #2507, #2532 and 4595 our Requistion #23028 dated 3/5/76 and add #1, dated 3/18/76. Req. 23284 dated 3/19/76. Req. 20147, balance, dated 5/21/74. Req. 23156 dated 12/4/74. Req. 23284, dated 3/19/76, is pending with us. At your option, we will fill these orders, or, if you so notify us in writing, we will accept a cancellation of these orders. In the absence of written word from you, we will fill the orders in the usual course of business and subject to our current terms and conditions of sale.

So far as outstanding commitments are concerned, we are allowing you a period of 15 days from the date of your receipt of this letter within which to place orders for our acoustical materials to cover your outstanding commitments therefore. In order to protect these commitments, we ask that you give us the name of the job, the location of the job, the name of the owner or general contractor, and the shipping instructions which must specify complete shipment within four months from the date of your receipt of this letter.

All sales of our acoustical materials to you under this letter will be at our prices and subject to our terms and conditions of sale shown in our acoustical contractor price list in effect when your order is placed. Except for your pending order referred to above, no material will be shipped hereinunder for stock.

Very truly yours,

Richard C. Wiley

Richard C. Wiley
Regional M[illegible]

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8/9/76 10:30 AM

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